Vol. 20, No. 9 SEPTEMBER, 1928

Journal of Home Economics

HOME ECONOMICS AND SCIENTIFIC PROGRESS: AN OPPORTUNITY

EDITH AYRES COPELAND

American Association for Medical Progress, New York City

No professional group represents the interests of the ultimate consumer (that is, the general public) more completely than do workers in home economics. Although a few years ago most of them were merely technicians in cooking and sewing, now they are engaged in studying the most fundamental problems affecting the family and social life. And at the same time they are attempting to fit the results of their study into the changing standards of practice.

It is important that consumers should have a group with professional training, devoted to its interests. In practically every field except that of 'just living,' science and technology have built up a tremendous structure of organized and specialized knowledge, in many cases available only to those who have had years of training. This knowledge is applied to the production of material things—radios and automobiles—which revolutionize our way of living almost overnight. Yet the consumer is obliged to make his own adjustments in any way he can. And the gap between home and laboratory becomes greater and greater.

Perhaps this is not altogether obvious. Scientific meetings are being reported more fully than ever in the daily papers. Research workers are urged to give out popular accounts of their work even when it is in very early stages. The public is so eager for news of new discoveries that discoveries are sometimes announced before they are even made. And all sorts of irrelevant conclusions are drawn from them. An illustrated article from some recent Sunday magazine section was entitled "Why 'A Slice of Liver a Day Keeps the Doctor Away.'" This slogan, the article says, "may now be quoted with excellent scientific authority. . . . . Possibly a slice of liver every day is not necessary for individuals in good health. A meal of liver once or twice a week is

probably quite sufficient." This conclusion does not follow at all from the actual scientific studies reported. In the popularization of two important pieces of research, one dealing with the discovery of vitamin A in liver and the other with liver diet in pernicious anemia, an immediate and universal application was simply invented. Naturally the effect of such newspaper publicity is bad. Liver has been taken up as a fad by people who have either no ailments at all or only some common type of anemia, in complete ignorance of the fact that liver has so far been found useful only for the relatively rare pernicious anemia. This has forced the price of liver up to the point where it is almost prohibitively expensive for those who really need it. No wonder the doctors and the research workers sometimes feel that more harm than good is done in the attempt to popularize their work.

Home economics workers do not need to be reminded of the dangers and difficulties involved in the popular exploitation of dietary fads. But perhaps it is not so well understood that this exploitation is possible largely because of general misconceptions concerning science and scientific method. When a commercial house offers a new soap to the public with the information that they have been able scientifically to control hydrolysis, one feels at first that it is a matter for congratulation that practically every adult should now understand the fundamental processes of chemistry. But apart from the notorious fact that the scientific language of advertisements has been adopted merely to flatter the readers, there is the consideration that if the readers were truly well-grounded in scientific method they could not be so taken in. No progress in popular education is indicated when bathroom heaters become "infra-red generators." Instead, what is indicated is that scientific vocabulary is a kind of magic to the ordinary mind.

Nowadays, apparently, the dry cereals recommend themselves to the public chiefly as aids to elimination, the idea having been previously established that special aid is needed. Similarly the fruit growers are beginning to broadcast the notion that acidosis (for which orange juice will be prescribed) is a practically universal complaint, with any or all of the following symptoms: head-ache, sour stomach, biliousness, nausea, children's 'upset stomach,' nervousness, sleeplessness, high blood pressure, acid perspiration, acid mouth, acetone uria (sic) and acid urine. The alarm over acidosis is then taken up by dietitians, who because they are so well-qualified to design special diets for special conditions sometimes forget that diagnosis is not within their field. Thus without realizing it, they may promote quackery instead of science.

The woman who reads popular magazines practically demands a special diet from her doctor, whatever her disorder may be. This makes things easy for the doctor who must prescribe a diet (his orders will be carried out more meticulously) but it does not conduce toward a better mutual understanding between doctor and patient. On the contrary, the doctor who feels that his patient is so gullible as to be impressed by the long names that are invented or promoted by national advertisers (e.g. halitosis, acidosis, cachexia, and many others) must hesitate to try to explain his diagnosis since the explanation will only confuse the patient and perhaps send her back to the pages of the popular magazines.

Yet we cannot say that achievements in the medical sciences should be reported only to those who can understand them in all their technicality. It is really important that those who have a responsibility for the health of young children should understand as much as possible of what is involved in new medical procedures. Department of health records often indicate stories like the one reported recently from Connecticut:

> A little girl aged four became ill November 20, 1927. A physician was not called until November 24, or four days after the beginning of the illness. Noting the condition of the child the physician advised hospital care or the administration of diphtheria antitoxin at home. The parents refused both methods of treatment and discharged the doctor. A few days later on November 26 another physician was called. He likewise advised antitoxin but was discharged. A culture which he took proved positive for bacilli. December 2, or twelve days after the onset of illness, still a third physician was called. He succeeded in getting the parents' consent to administer antitoxin. But the poison from the diphtheria bacilli had already so affected the child's body that paralysis of the throat developed after recovery from the acute illness. On January 6 a fourth doctor was called on account of this paralysis. He sent the child to a hospital. The next day the parents took the child away from the hospital against advice. On January 11 the child died with no physician in attendance.

The Connecticut bulletin remarks that while the death certificate shows post-diphtheritic paralysis as the cause of death, it is hard to escape the conviction that the child actually died from parental neglect. At least it might be fair to say that the child died from parental ignorance.

Cases of this sort, while much too common, are still very rare when compared with those of less immediate importance to the life of some single individual. In the very large cities, of course, matters affecting the health of the whole community, such as the purification of the water-

supply, milk inspection, and control of communicable diseases, are all cared for as a matter of routine and supervised by experts. Progress in public health comes by way of the research laboratory. But in the little places protective measures must often be initiated by the citizens themselves, and this implies that citizens must keep themselves informed of each new procedure as it becomes standardized. Farmers must understand why it is important that their cows should be tuberculin-tested, and not simply that they must be. Farmers must know whether the testing itself is a harmless procedure, or whether, as has been alleged by the opponents of public health measures, it gives the cows tuberculosis. They should understand enough of the method by which procedures of this sort are worked out to guard themselves against the alarms of pseudo- and anti-scientists.

The development of preventive medicine has made it necessary for people to understand more and more of the actual mechanism of medical technique. For they are called upon to submit their bodies (and those of their children) to hypodermic needles and other instruments which are alarming to those who do not understand them. They must do this not only to keep disease away from themselves but also at times to help others in the struggle against disease. People had some time ago to accustom themselves to the idea of blood transfusions. More recently it has been learned that when patients are recovering from certain infectious diseases, such as measles, their blood contains an immunizing principle in greater strength than at any other time, and that this can be elaborated into a serum which is of great value for those who are just coming down with the disease. Consideration for the general welfare, therefore, demands from the convalescent a contribution of their blood. But however important the consideration, a thing of this sort cannot be asked of people who do not understand the significance of what is being done. The problem then is how they can be taught.

It might be well if the men who are actually engaged in research could spend larger amounts of time in popularizing their work. But even when they try to do this the results are sometimes unfortunate. There is a story of a woman who went home from a lecture on the thyroid gland to give her daughter a tablespoonful of tincture of iodine because the lecturer did not realize that "iodine" to some in his audience meant only the well-known antiseptic.

Even when research institutions attempt to give out carefully written releases on the results of their work these releases are often re-worked by the newspapers into something quite meaningless, or into something

so much like a bed-time story that even the "average" reader is insulted. Unless newspaper articles are written by men who understand research they are likely to be hopelessly romantic. What sort of idea, for example, would the ordinary person get from the following account of cod liver oil?

> In the ocean the little sea beasts with wiggly tentacles absorb the ultra-violet rays from the sun and in the little sea beasts originate vitamines A and D. The cod eats the little animals, and in the cod's liver are stored just oodles of these vitamines. The fish are caught, robbed of their livers, which are boiled and refined, and what have we? Cod liver oil—liquid sunshine.

There is, to be sure, an increasing number of well-written magazine articles reporting the advances of science in every field. But though they succeed in being both popular and accurate they may still cultivate the romantic attitude by giving only the results of scientific work, with little or nothing of the method. The actual processes of science, the formulation of problems, designing of special apparatus, controlling of experimental conditions, and all that are far too often ignored.

When only the results of scientific research are reported people get the idea that science can or ought to be able to do almost anything. Nothing seems too miraculous or surprising to believe. The quack is as readily believed as the professor. Not long ago it was possible for the promotors of a secret cure for tuberculosis to claim for it the endorsement of science because they had gone through some of the motions of an experiment on seven cows. People do not know how to distinguish between real and false experimentation; some of them believe in a single testimonial as though it were fully as significant as the account of many controlled observations.

Others refuse to believe at all in scientific work because these results are achieved too slowly, or because they are never absolutely final. Cancer experimentation should be abandoned, say the anti-scientists, because it has already been going on for a long time without arriving at an absolutely certain cure. A highly technical article appearing in a scientific journal was written up in the popular press under the headline "Germ Theory Shattered;" and the conclusion ran as follows:

> In view of the latest medical theory that an unseen and unknown element is the primary factor in the cause of contagious disease no one can fail to appreciate the enormity of the imposition upon the American public for health boards to spend hundreds of thousands of dollars of public funds for the promotion of vaccines and serum and to seek to make their use compulsory.

An interest in the results of research rather than in its method and process is much like the interest in the latest best-sellers, lagging as soon as the new discoveries have ceased to be new. Everyone is familiar with the woman who has forgotten all about calories now that vitamines are in vogue. Each new discovery appears to her as something which supersedes and contradicts the older knowledge.

Workers in home economics have a unique opportunity to create a better understanding between the laboratory and the home. For on the one hand they represent the interests of homemakers in the struggle for a better existence, no small part of which is concerned with health. And on the other hand they represent an effort to apply to the problems of family life essentially the same scientific technique which has proved so useful in medicine and other fields. In the field of nutrition, indeed, the distinction between medical research and research in home economics has become almost academic. The scientific nutrition worker has every qualification for explaining to those whose interests are being served directly not only what foods are essential to health but how these foods are known to be valuable.

Negatively a great deal can be done to promote an understanding of science by combatting the obvious food quackeries. Quackery appears now in the advertisements of reputable products through subtle suggestions that large sections of the public are suffering from particular disorders, or that the food products of rival concerns contain ingredients (such as alum) which are by implication undesirable, although no scientific evidence for condemning them exists. These matters are the professional concern of home economics workers, quite as truly as the publication of the truth about quack drug-store remedies is properly the concern of the medical profession.

In the choice of educational method home economics workers have the advantage over other groups that their field is still growing very rapidly. They are less bound by tradition than teachers in the older sciences. It may therefore be possible in their formal teaching to break away from the tendency to make the laboratory a place where students learn to follow specific directions and get certain pre-arranged results and make it rather the place where students learn method.

Towards the consuming public as a whole, home economics workers should more and more expect to be the interpreters of scientific achievement in all the fields that affect home life. This is a tremendous task, but it is one which must be faced by some group and there is no other group as well equipped. The general task of adult education calls

particularly for a constant emphasis on the logical elements of scientific method wherever experiments are being written up for the information of the public. Some idea of the connection which one piece of research has with others in the field must be made apparent, so that theories based upon years of experimental work may seem less like the fads with which they are now so often confused.

It would perhaps be better not to picture the scientific method even in popular presentations as a great deal more simple than it is. The results of a single experiment on the diet of white rats should not, for example, be made the occasion for a concrete recommendation to householders, nor for allowing them to make their own applications. People who have come to scorn attempting to prove their assertions with the old familiar "I once knew a man who,—" are now trying to use simple, unverified, or partial experiments in much the same way. The result is confusion for the public, and ultimately a discrediting of all scientific reasoning.

Some discretion must also be used in reporting experiments in fields where scientific method is still in a rather unscientific stage. Interesting as is the work that is being done in such fields as the psychology of childhood and the economics of consumption, it cannot be claimed that as sciences psychology and economics are much beyond their infancy. Too great an enthusiasm for applying scientific technique to all the problems of living may tend to an uncritical use of the technique, may tend, that is, away from science rather than towards it.

The danger in any educational process is very great. There are always those who will misuse their bits of knowledge. But the importance in this field outweighs the danger. For unless the real significance of work in scientific laboratories can be understood by the mass of people for whose benefit it is undertaken, the work itself will gradually become less useful.

WHERE ARE WE GOING IN HOME ECONOMICS?[1]

DAVID SNEDDEN

Teachers College, Columbia University

The topic, "Where are we going in home economics?" implies where are we going in that group of studies, cultural, physical, social, and vocational, which cluster close about, or somewhere in the peripheries of, training in food-buying, preparation, and serving; clothing selection, upkeep, and construction; child care, nurtural and educational; house care; laundry; budgeting; and a variety of other miscellaneous activities centering in home building, household conservation, family development and maintenance, household education of the young, home conservation of health, domestic sociability, and the rest. Some enthusiasts seek to persuade us that in large measure personal hygiene, sanitation, such cultural studies as music, literature, the applied arts in fabrics and wood, and the economics of utilization should be chiefly studied in relation to the home. Certainly home economics teachers seem always eager to invade the territories which a wiser division of labor, it seems to the writer, would leave to physical education in its divisions of personal hygiene, sanitation, and growth conservation.

Experience adds to the writer's conviction that good or efficient education of any kind can only be achieved through clear comprehension of values and specific definition of purposes. As respects those values and purposes, home economics is still very vague—no more so, perhaps, than most divisions of physical education, several divisions of cultural education, and all divisions of education for moralities and civisms. It is certainly to be expected that the next decade or two will witness great advances in our knowledge of needs in the fields impinging on home life and in our mastery over the educational means of reaching them. Meantime the question, "Where are we going?" is suggestive, and the writer wishes to submit a series of "pertinent postulates" as to things which seem to him sufficiently "new and true" to deserve from teachers of home economics either support or determined opposition.

Sociologically, the home has evolved as an agency of residence, nurture, productive work, and education primarily for the rearing of children into capable men and women—that is, as a nursery of family life, whose primary function is the rearing (not the procreation) of children. Hence it is sound social policy that home economics education

[1] Based on a discussion held at a meeting of the New Jersey Home Economics Association. April 28, 1928.

should be organized and directed as fully as practicable to meet the needs of those who, on the one hand, will probably rear the most children for the community, and who, on the other hand, because of various personal and social limitations, may expect least preparation for this work from non-school sources.

Girls of less than median intelligence today, who for that and for economic reasons will probably never enter the ninth grade, will probably be rearing fully two-thirds of the children of 1940–1970. These girls come usually from the poorest homes, and spend most years prior to marriage in wage-earning work. Hence three-fourths of all money put into home economics secondary education should somehow be used to serve girls of this type. Girls of the highest fourth of intelligence, if coming from fairly prosperous families, will contribute but little to the family life of America for the next generation or two. The marriage rate among them will be low; the natural or artificial sterility rate will be high; and among the fecund, the prevailing size of families will be abnormally small. On the other hand, the capacities of these girls to learn through self-education such home economics as they may later need will be exceptionally good. Hence America need concern itself but little with ordinary home economics education for the kind of girls who can easily graduate from our high schools or enter college, except as some of these should be prepared to be teachers in this field.

Up to the ages of twelve or thirteen, girls are very much home centered. After those years the great majority, in obedience to entirely normal instincts, and even in spite of some lingering social customs, tend gradually to sever their devotion to and their dependence upon the parental home, and with the freedom made possible for American girls this detachment from home influence culminates during the years 16 to 20, somewhat according to economic status and need of early self-support. During these years of "flitting" from the parental nest, it is practically futile to use the girl's home life as a background or basis of productive work for home economics or skills beyond those acquired before 14 or 15.

Girls from 15 to 18 years of age, under American conditions, are far from being motivated for preparation for effective service as prospective homemakers. Their vision, their emotions, and their aspirations at this age are entirely romantic, creations of a pinkish, luminous haze. In general, they seem almost instinctively to react antipathetically towards the slaginess, and, to them, ineptitude of parental achievements. We should not, therefore, expect vocational motivation for homemaking on their probable economic plane for girls of this age, except the most

dependent or least imaginative and adventurous—true "mother's girls," in fact. But those are peculiarly the years of high motivation for two types of education closely related to home economics, viz: personal regimen—self-care, self-decoration, self-enhancement, social relations, spending, adolescent utilizations,—all rather highly and properly individualistic; and cultural enrichment (visions, aspirations, appreciations of the large, the progressive, the new, the other half, and so on). Imaginatively, spiritually, emotionally, girls of these years, and perhaps above all the most intelligent, are ready for a rapid enlargement of their world of appreciations and aspirations, especially if the process be not too prosaic. It is likely that eventually we shall find this also a fruitful period for the formation of small group and political moralities and civic ideals.

The vocation of homemaker under American family conditions has not yet been adequately "job-analyzed." In a basic sense husband and wife equally make the home, as they rear children. But ordinarily the man contributes his share primarily through his competence as the wage earner. Incidentally and through cooperation in moral sustenance (but not vocationally) he contributes to homemaking, as his wife contributes incidentally, but not vocationally, to his farming, mining, or law practice.

The wife and mother, under all normal conditions where she is not an out-worker herself, is no less a producer of goods and service than her husband, but her production is under conditions which permit her to care for the children as a part of her vocational or by-vocational processes. Her production is, obviously, chiefly the conversion or raw materials or manufactured products into immediate shape for utilization by the family group—cooking, serving, washing, buying, arranging, teaching, housing, supervising, and the like. We can all readily name hundreds of the "strands" of homemaking activities; but almost no scientific techniques have yet been devised for interpreting these "strands" into "course" elements or activities for instructional and training purposes.

The conditions reviewed above suggest to the writer that home economics education is moving towards:

a. A variety of fragmentary, incidental, developmental offerings in the first six grades—amateur projects, readings, correlations of school work with a few home activities, and so on.

b. A year course in rather amateur-spirited household arts, offered in junior high school eighth grade, but arranged to receive any 13-year-old girl desiring

it, even if she has reached only third or fourth grade. This course should be essentially developmental, should not aim at producing more than a few sequences of fixed knowledge, should lead to many "arts" appreciations, should have many projects, and probably should be elective.

c. A half-year "personal regimen" course, elective, but designed primarily forthose who will probably leave school early.[2]

d. A one-year course in cultural home economics, preferably in ninth or tenth grade, open to all girls over 14, essentially inspirational, developing appreciation of modern American family life, relation of home to community, the modern household, use of power in home work, ideals of child rearing, pathological features of present-day marriage, family rearing, adolescent youth, unwise parents, and so on. Much reading and discussion, as much visiting as practicable, use of exhibits to the utmost, little performance work in food preparation, dressmaking, or laundry, no project work if previous junior high school course has been generally taken.

e. Half time (for 20 weeks) or full time (for 10 or 12 weeks) vocational homemaking course in large high schools for girls of 15 to 18, directed toward household wage-earning service or mothers' helper service (two-thirds of work on practical, productive projects in neighboring homes).

f. Full time vocational homemaking curriculum (12 weeks, 40 hours per week) for young women, ages 18 to 30, designed primarily for those contemplating or just entering matrimony. From one-half to two-thirds of time on practical productive work, taken on "unit" basis, in neighboring homes.

g. Extension, part time continuation school or correspondence courses, usually vocational, always on "short unit course," intensive basis.

In every high school in the United States with 50 pupils or more, the one-year course in cultural home economics should be primarily adapted to tenth-grade pupils, but open if possible to any girl of 15 or more from the seventh to ninth grades. This course should be urged for one unit of college admission requirements, should be based primarily upon readings (but given concreteness by some visits, some laboratory demonstration work, perhaps a few home, extra-home, or neighborhood projects) and should aim primarily at developing appreciation. The following topics are samples of what might be offered:

1. The American family evolved and evolving in best American ideals and practice.

(a) Marriage, monogamous, life-long, based on affections, involving fidelities, and similar traits.

(b) Equal economic responsibilities of parents.

(c) Progressively improving family care of children, paralleled by steadily diminishing size of usual normal family. American tendencies towards

[2] Home Economics Education. Studies of vocational and general courses. Edited by David Snedden. New York: Bureau of Publications, Teachers College, Columbia University, 1924, pp. 11–12 and 109–160.

race—or rather stock-suicide through voluntary sterility or excessively diminished fecundity among the prosperous, the sophisticated, the over-cultured,—those addicted to the "cost of high living."

(d) Diminished economic participation in home work by children, or in extra-school earnings at ages which will help family incomes. (Note changes even in farm families.)

2. The home as the long-evolved agency essential to the best rearing of children, the primary educational agency especially as regards linguistic, moral, social, health-conserving, cultural, individual, and even religious factors.

(a) Value of farm-home rearing in American history; limitations of urban homes; vacation compensations.

(b) Home life incidentally of value to adults, though not essential if family is not involved.

(c) The fullness of modern household influences for children under ten and the dwindling of such influences after 14.

(d) Schools as destructive rivals of household influences.

(e) The prevailing small size of American households, as contrasted with Oriental, older European, and early American, when aunts, and other relatives foregathered.

3. The wife and mother in the normal family home as full-time vocational worker with food preparation and serving, house care, nurture of children and husband, clothing and laundry, child education, family social life, care of sick; and as accessory to all these, such activities as budgeting, buying, fostering self-culture, voting, and so on. Modern tendencies in specializing certain types of work away from homes. The wife and mother as the buyer of 80 per cent of all consumable products.

4. Conditions of out-working, wage-earning wives and mothers. Historic and modern tendencies. The plight of vocations for white-collar men.

5. The physical conditions of preparation for the performance and self-realizations of effective motherhood.

6. The out-working and household-helping conditions of good American fatherhood.

7. Modern American progress in use of scientific knowledge in households:

(a) Health conservation—foods, reducing infant mortality, soaps, ventilation, open air sleeping, etc.

(b) Improved equipment in household work.

(c) Economic production—cold storage, pressure cooking, household dyeing, etcetera.

8. American progress in making music available in households.

9. Playthings and facilities for children; children's reading.

10. Cultural ideals practicable for American rural homes; for urban homes of less than $2000 budget.

A STUDY OF SCHOOL LUNCH ROOMS IN KANSAS

ZOE WOLCOTT

Pittsburg, Kansas

The information here brought together was obtained from the returns of a questionnaire sent out in the spring of 1927 to the colleges and ten of the larger high schools of Kansas, in the hope of learning something regarding the way in which their lunch rooms were operated, the number of persons fed, the number of helpers required, and similar items of interest to those responsible for this important part of the institution.

School cafeterias or dining rooms were reported in nine colleges and normal schools: Kansas State Agricultural College, Manhattan; University of Kansas, Lawrence; State Teachers Colleges of Pittsburg, Emporia, and Hays; College of Emporia; McPherson College; Sterling College, and Washburn College.

Eight high schools also reported cafeterias: Argentine and Central High Schools, Kansas City; Coffeyville; Independence; Parsons; Pittsburg; Salina; Seaman Rural High School, Topeka; and Wichita.

Reports on equipment seem less comprehensive than on other items. All institutions reporting equipment had electric dish washers, and almost all mentioned electric mixers, vegetable peelers, and slicers. Can-openers, steam cookers, and chopping machines were reported by three institutions; toasters, electric refrigerators, and apple peelers each by two; and the following were listed once: butter cutter, ice chipper, milk pump, vegetable shredder, checking machine, washing machine, grinder, dumb waiter, and belt conveyer to carry trays to the kitchen.

Other items are given below as reported by each institution.

At Kansas State Agricultural College, about 650 are being served daily in the cafeteria, the tickets averaging 24 cents. The cafeteria is used as a laboratory for institutional work two afternoons a week. In connection with the cafeteria, there is a little tea room open for the evening meal only, which is served table d'hôte. The members of the advanced class in institutional economics each work in the tea room several days and are responsible for the planning and serving of special dinners. The cafeteria employs 12 full-time workers and 25 students who are paid 27 cents an hour. Last year the cafeteria served 15,760 people at special dinner parties and banquets with $7518.49 in receipts.

At the dormitory about 300 meals a day are served, at $5.50 a week. The food service is a part of the department of institutional economics.

Four regular workers and seven students are employed. Students are paid 25 cents an hour.

At the University of Kansas a cafeteria is operated, serving about 100 at breakfast and 350 at noon. No evening meal is served. The average ticket for breakfast is for 17 cents and at noon for 32 cents. The cafeteria is not a part of the home economics department. Six regular workers are employed, and 15 students, who are paid 30 cents an hour for counter work and 35 cents as checkers and cashiers. Table d'hote meals are served in the dining room of the dormitory.

At Teachers College, Pittsburg, about 700 are served daily, with an average ticket of 26 cents. There are 14 full-time employees and 18 students, who work three and a half hours a day in return for their board. All the full-time employees except the janitor are women.

A tea room in the home economics building, operated during the second semester and the summer session, is used for observation and practice by all classes in institution management, and especially by the advanced students. The classes in institution cookery do the planning, marketing, and serving of meals.

A training table for athletes is maintained at the cafeteria throughout the year, with table d'hôte meals at $4.50 a week.

Children at the training school are served with 15-cent lunches as a part of the school's health program. The menus are carefully worked out to meet the needs of the children and there is no choice of foods.

A feature at the cafeteria which has proved popular is a 15-cent plate lunch, consisting of a small serving of meat, two vegetables, and rolls, biscuits, or muffins, and butter. People prefer it because they frequently like a small serving of meat and a variety of vegetables when the usual size of servings of these foods would be more than they care for.

All banquets for school organizations as well as some city groups are served on the campus, the larger ones in the cafeteria, and the smaller ones in the Carney Hall tea room.

At the State Teachers College of Emporia, about 870 meals daily are served in the cafeteria, the tickets averaging 25 cents. The cafeteria has no connection with the department of home economics. It employs 15 full-time workers and 26 students, who are paid 27½ cents an hour.

The State Teachers College of Hays serves an average of 600 meals daily. Cafeteria style of serving is used only in summer school. The food service has no connection with the home economics department. Four cooks are employed and 42 students, who are paid at the rate of 30 cents an hour. The workers attend to all the laundry for the kitchen. Meal tickets are sold at the rate of 20 meals for $5.00, or 14 dinners and

suppers for $4.00. Single meals are: breakfast, 20 cents; noon meal, 35 cents; evening meal, 25 cents.

At the College of Emporia there is no cafeteria service. About 240 are served in the dining room.

At McPherson College about 495 people are given table d'hôte service daily, at 30 cents a meal or $73.00 a semester. Five regular workers are employed and 15 students, who are paid 20 cents an hour.

At Sterling College the cafeteria serves 385 daily, the tickets averaging 55 cents a day. There is no connection with the home economics department, except that dishes prepared in class are sold at the cafeteria and the proceeds go back to the home economics department. Four regular workers and 30 students working two or three hours a week at 20 cents an hour are employed. With the exception of a few salads and desserts, steak and roast, the dishes are five cents each; nothing is over ten cents. The workers bake all the bread and pastries and launder the tea towels.

At Washburn College 75 persons are served three times a day, the dining room in the girls' dormitory being used. There are three regular employees, and four students act as waitresses and are paid in meals. Breakfast and lunch are served cafeteria style and dinner table d'hôte. There is no connection between the dining room and the home economics department.

At the Wichita High School the cafeteria serves 2975 each noon with an average ticket of 18½ cents. The cafeteria is not a part of the home economics department. There are two dining rooms, one for students and one for faculty. Occasionally dinners are served in the evening to different school organizations. The workers employed include four colored men for full time, 25 women full time, one woman part time, and 88 students who assist during the serving period and are allowed a 30-cent lunch for one hour's work. All prices in the cafeteria are five cents or lower, with the exception of meat, which is ten cents. The sale of salads has greatly increased since the price was reduced. Students are aided in the selection of well-balanced meals by a discussion of the day's menu in health education classes.

At the Argentine High School in Kansas City, the number served at noon is 150, with an average ticket of 20 cents. The director is a member of the home economics faculty. Just before lunch a class of 16 girls prepare salads, sandwiches, and desserts, cut bread and pies, and place the food on the counters. The class is divided into groups and the work changed so that it does not become monotonous. Eight

girls serve at the counter in return for a 15-cent lunch. One full-time worker is employed in the kitchen.

At Central High School, Kansas City, the cafeteria serves 600 meals at noon with tickets averaging 15 cents. Menus are worked out by the food teachers and cafeteria director, who is considered a member of the faculty group. The cafeteria furnishes supplies, and the members of the foods classes prepare foods that the girls are working on at the time as a class problem. Five regular workers and 12 students, who are paid in meals, are employed.

At Seaman Rural High School, Topeka, from 70 to 90 persons are served a table d'hôte meal at noon for which the charge is 12 cents. Students in the first and second year food classes plan menus, keep books, prepare most of the food, and do all the serving. The routine work, such as preparation of vegetables and washing dishes, is done by the matron. About one-third of the girls' time is given to cafeteria work. During the past six years the annual profit of $200 has been used for equipment or for some good cause connected with the school.

At Independence High School, noon meals, with tickets averaging 18¾ cents, are served. A course in cafeteria cookery is offered as an elective but it is not encouraged. Girls from the home economics department serve during lunch.

At the Coffeyville High School the number served at noon averages 105, and the average ticket is 20 cents. A ten-cent lunch including a meat substitute, slice of bread, butter, vegetable, and dessert, is served, with pie, cake, puddings, salads, milk, cocoa, candy, and sandwiches as extra at five cents each. Coffee is served to teachers only. One full-time worker is employed, and 17 students at 30 cents an hour.

At the Parsons High School between 200 and 300 are served at noon. The average ticket is 15 cents. A class in cafeteria management prepare salads and sandwiches, get the counters ready, and do the serving. Four full-time employees and 50 students are employed. Drinking fountains in the dining room eliminate water glasses and save washing.

At the Pittsburg High School from 475 to 550 are served daily at noon, with an average ticket of 17 cents. The cafeteria bears no relation to the home economics department. Seven full-time workers and 11 students, who are paid 25 cents an hour, are employed.

At Salina High School, the cafeteria class of the home economics department prepare the entire lunch, and special students serve and wash the dishes. The luncheon price is fixed at 20 cents. The faculty have a separate dining room.

FATIGUE STUDIES IN HOUSEHOLD TASKS[1]

A. H. RYAN

Consultant, Hoover Laboratories, Chicago, Illinois

In considering fatigue studies in household work we are not interested, I take it, in simply measuring and comparing the fatigue produced by single isolated household tasks, but rather in the larger problem of housework in its relation to the health and happiness of the homemaker. Fatigue study, leading to fatigue reduction, would then become of interest in so far as it might provide more time and energy for the accomplishment of those things, be they additional physical tasks or avocational or cultural pursuits, which lead to a fuller realization of life. For what then may we hope from an experimental study of housework as a means of aiding in progress towards this goal? (1).

At the outset, we must agree on a definition of fatigue. Our present conception is in the nature of theories to explain certain observed facts, a conception which may be useful if we do not attempt to theorize too far from the observed facts. What then are these facts?

First, the general and traditional experiences of men concerning the effect of prolonged muscular and mental activity in its relation to subjective sensations, lowered working capacity, sleep and rest required for recuperation; and observations of the same sort on the effect of prolonged muscular activity on domestic and migratory animals.

Second, laboratory experiments, physiological, chemical, and psychological. Chemical and physiological experiments have indicated a definite quantitative relationship between the degrees of muscular activity and oxygen consumption and heat production. Also it has been demonstrated that chemical substances are formed in the muscle during activity which must be removed in order that the capacity for muscular work may continue undiminished.

In the psychological laboratory (and it is difficult to draw the line between physiological and psychological experiments) effects of prolonged complex or mental activity have been more difficult to demonstrate. However, some simple acts have been outlined, such as additions, cancellations, and choice reactions, which involve the presentation of various stimuli and permit recording the fidelity of the reaction and

[1] Paper presented at a conference held in Chicago, November 18 and 19, 1927, under the auspices of the Committee on the Relation of Electricity to Agriculture, to consider the status of home economics investigations as related to the use of electricity.

the time required for it. Certainly very prolonged activity or prolonged loss of rest, which is equivalent to the same thing, results in deterioration.

Third, industrial observations. A considerable mass of observations contributed by students in industrial psychology, industrial physiology, and scientific management, have indicated that very prolonged activity results in decreased hourly and daily output and in deterioration of the quality or fidelity of the worker's response as indicated by work spoilage and accidents.

Fourth, medical science. Studies in this field have contributed the observation that complete or partial incapacitation for work in the form of illness may follow extreme prolongation of activity, either physical or mental, without sufficient intervals for recuperation.

The great mass of observations which have been very briefly outlined seem then to indicate that if we alter the relationships between activity and rest on the part of an individual we may produce differences in his reacting or working capacity. With a certain ratio between work and rest the daily working capacity may remain the same indefinitely. With a rise in the ratio of work to rest a fall in the working capacity may occur, and if this ratio is continued sufficiently long, illness with partial or complete incapacitation may result. The biological condition associated with such a decreased working capacity we call fatigue. As yet we do not know the curves of relationship between the degree of reaction or work and degree of fatigue. Fatigue may be decreased by decreasing the reactions either through rest, sleep, or a substitution of other types of reaction.

In the light of these observations, the general problems of research in the field of housework may be outlined as follows:

1. Study of standard household tasks and formulation of their most efficient methods of performance under various typical conditions (including the use of labor saving equipment).
2. Study of the length of the working day and formulation of the most efficient hours of work.
3. Study of the systematic employment of rest pauses, recreation, and sleep to increase efficiency.

Regarding the study of standard household tasks and their performance, housework is so varied that the best we can hope to do for the present is to analyze and improve those which consume a large portion of the houseworker's time and effort. Such a study may include the following:

a. 1. *Psycho-physiologic analysis.* Study of motions, rhythm, and attention, having in view the elimination of as many motions as possible, but not those which tend to relieve the attention and to facilitate rhythm and smoothness or fusion of the component motions. The study of the component motions in a cycle of motions employed in any task may be made by simple observation, instantaneous photographs including motion pictures, and signal magnets and recording tambours, which are standard equipment in psychological and physiological laboratories. The stop watch and recording time clock may be used in recording movements of longer duration or periods of continuous repeated activity (2, 3, 4, 5, 6).

2. *Sensory analysis.* The fineness of the sensory discriminations which are required in the performance of a task determines the degree of attention which must be employed and affects both the quality and the quantity of work. An attempt should be made to decrease strains upon the attention either by increasing the contrasts or by substituting if possible another discrimination involving a lesser degree of attention. For example, if a fine visual discrimination is employed in the task, the provision of better illumination would increase the contrast and relieve the attention; or the degree of difference discriminated might be magnified in some manner to accomplish the same end (3).

b. *Energy costs.* It is well known that energy transformations are associated with muscular activity and that the degree of these energy transformations is a measure of the work performed. The extent of the energy transformations in man may be measured either by directly determining the heat lost per unit of time or by measuring the oxygen consumption and carbon dioxide production and from these calculating the heat lost. The former method, directly measuring the heat lost, requires very expensive apparatus, and frequently limits the scope of studies which may be undertaken. Energy cost determinations, on the other hand, based upon the collection and analysis of expired air, or indirect calorimetry, involving comparatively inexpensive and simple equipment, are easy to carry out and may be performed under home conditions upon a great variety of tasks. Many modifications of this principle have been employed by various investigators in determining the energy costs of reclining, sitting, walking, marching, and mountain climbing.

In 1923 the writer began a series of studies upon the energy costs of certain household tasks employing the indirect calorimetry method. The expired air was collected in a Douglas bag, a cloth covered rubber bag about two feet square, carried on the back and connected by means of a large rubber tube with a mouthpiece through which the subject breathes. Light rubber valves in the mouthpiece direct the course of the expired air into the bag, while room air is inspired. At the end of an experiment the expired air is measured by passing it into a tank which is calibrated or through a gas meter. As the air is expired from the bag, samples are withdrawn into glass bulbs and are sub-

sequently analyzed in the Haldane gas-analysis apparatus; the percentages of oxygen and carbon dioxide are thus determined and these values after correction for standard temperature and pressure may be used to calculate the heat production per unit of time. For many purposes it is merely necessary to record the oxygen consumption per minute. The capacity of the bag permits of carrying on a work experiment for a period of four to six minutes. During a work experiment it is desirable to have the subject perform work for a preliminary period of from four to five minutes at the identical task, with the bag and mouthpiece in place, so that she comes to a condition of work equilibrium.

These energy cost tests are best performed in the morning after a light breakfast of toast. The resting energy cost is first determined after one half hour reclining upon a cot. If the resting energy cost is subtracted from the total working energy cost the net energy cost of the work may be deduced.

Extensive studies have been made by the writer upon the energy costs of different methods of cleaning floor coverings. Certain details of the method employed will illustrate essential points in the planning of energy cost tests. I may say that such tests are of little value in indicating the comparative fatigue of different tasks unless these tasks employ in their performance the same muscle groups, although they may be of value in determining the food requirements. For example, high energy cost would be associated with the movements of large muscle groups in the back and legs, whereas a low energy cost would be associated with movements of the eyes, fingers and hands, though in the latter case these activities might be more fatiguing in their demands of skill, coordination, attention and repetition. The method may be very valuable if planned properly, and is especially suited to the comparison of various modifications of the same task.

Various methods of sweeping with the cleaning devices in common use, excepting that of the broom and in some instances the carpet sweeper, all involve practically the same muscle groups. It remained only to standardize the length of strokes and number of strokes per minute in order to obtain comparative data. A metronome was used to standardize the speed of movement which was decided upon after a study of the methods ordinarily employed by women in sweeping, and the total time required to clean a rug.

Practically the identical method was employed under the direction of Professor E. P. Cathcart in a study of the comparison of the energy expenditures of a woman carrying loads in eight different positions (9).

A brief review of the results obtained in the studies upon energy costs may serve to indicate the possibilities of the application of this method. Using the respiration calorimeter with the limitations necessarily imposed by it, the energy costs of certain household tasks, including sewing, ironing, dishwashing, washing towels, and sweeping a bare floor, have been determined (10, 11). In addition to comparing the energy costs of different tasks the energy cost

of the same task was determined when performed in different ways. For example, the energy cost of dishwashing was shown to be considerably less with a table of the proper height, and the energy cost of sewing was found to be considerable less when foot power or electric power was substituted for the hand method. The reduction in the energy cost with foot power was about fifty per cent, and with electric power the reduction was about eighty-five per cent per meter of sewing.

Our results using the Douglas bag and the Haldane gas-analysis method indicate that the energy cost of sweeping a Wilton rug with a broom is ten times as great as with a vacuum cleaner, and that the energy costs of operating certain vacuum cleaners is as much as three times the energy cost of others. Also different speeds of the operation of the same cleaner give differences in energy costs.

In the simple task of carrying a weight, Bedale (9), also using the Douglas bag and the Haldane analysis method, found that the energy cost of carrying the same weight was fifty per cent higher when the weight was carried on the hip than when the weight was carried by means of a yoke. Furthermore, this study showed that when the weight is increased within certain limits the energy cost rises in proportion to the increase of weight, but that beyond certain limits the energy cost rises relatively much more than increase of weight.

c. *Repetitive optimum* (12). It has been shown that in doing the simple task of dishwashing once daily instead of three times daily a saving of twenty per cent in the time required was accomplished. Undoubtedly, a portion of this saving is attained in the single assembly and replacement of the materials used. On the other hand, we know that the speed performance of a single task increases as the period of work is prolonged up to a certain point. A certain amount of warming up seems necessary. In this warming up process previous distracting conditions disappear and lost rhythm is recovered.

These observations carry the suggestion that after studying the various phases or cycles of given tasks and planning the most efficient methods for their execution we may possibly so arrange the housework as to permit of the accumulation of work or tasks, so that advantage may be taken of the benefits of repetition. On the other hand, industrial observations on output as well as laboratory experiments show that repetition beyond a certain point is associated with a decrease in the quantitity and quality of the work, a post-maximum drop.

In order to study and utilize these factors it is necessary to select tasks which may be standardized and made repetitive. After standardizing a task, hourly output studies would have to be made in order to determine the proper speed of work at a given task. In making such hourly output studies advantage might be taken of the opportunity to study certain house tasks which are commercialized, such as hand laundrying or sewing.

d. *Plan and schedule.* Assuming that a large proportion of housework could be improved through scientific study it would further remain to arrange for its performance in the best sequence and according to the time available, with the most effective provision and arrangement of the necessary materials and equipment.

In a study of the length of working day and formulation of the most efficient hours of work for housewives, the problem is not entirely one of output. If we may assume that the houseworker should have time for avocational or improvement activities as well as recreation, it is desirable to ascertain whether the length of the working day provides her on the one hand with the time, and on the other hand with the energy or aptness required to carry out such pursuits. In formulating the proper length of the working day we should therefore have to study first, the hours of work in relation to production; and second, the hours of work in relation to the worker's physiological and psychological condition at the end of the working day.

Industrial experience has shown that the hours of work may be decreased when the working day is long and at the same time an actual increase in the total day's production, may be obtained. An important point in this experience, however, is that the improvement in output may not take place for several weeks after the hours are shortened (13). It has also been found that with longer working days the hourly output toward the end of each half of the working day is not so well maintained as in the shorter length of working day. These observations would suggest studies as follows:

1. Study of hourly work curves and total output in repetitive household tasks found industrially under different lengths of working days; for example, laundry work, sewing, flower making, etc.
2. Study of actual home workers to ascertain the time that is spent on certain standard tasks when performed in longer or shorter working days.
3. Experimental studies on home economics students performing standard repetitive household tasks throughout working days of different lengths.

It is possible that by standardizing and grouping tasks so that on given days certain tasks constitute a major portion of work, days of optimal length may be prescribed for each type of task.

Only brief suggestions may be made as to hours of work in relation to fitness for avocational or improvement activity, including business and

professional activity. It would in general be necessary to choose or devise a test giving a positive correlation between the score in its performance and success in the avocational or improvement activity. Tests which might indicate the fitness of the subject in the pursuit of the avocational or improvement activity might be applied to the houseworker engaged under different lengths of working day. Such tests are for the home economics student who is willing to prepare herself to employ the methods of experimental psychology.

A study and plan of the most efficient method of working, and length of the working day would be incomplete if it did not consider rest pauses, recreation, and sleep. Where the work is repetitive a study of the hourly output curve would indicate the proper place to interpose rest pauses, since the need for rest is indicated at the point where the output begins to deteriorate. Where the work is not repetitive the proper location and duration of the rest pause is not so readily ascertained but could possibly be approximated by experimentation.

The factor of sleep should be reasonably controlled during a series of output studies, especially if the group studied is small or the period of study short. The relationship of lost rest to output is suseptible of study in repetitive operations or upon the quality of work in certain nonrepetitive tasks. Such studies should indicate the degree to which rest may be lost without impairing efficiency.

The foregoing brief analysis of the problem is made in an optimistic attitude. I realize fully the difficulties presented, but feel certain that progress may be made. It seems to me that the time has come when home economists must accept the responsibility for research in this field as they have accepted this responsibility in the field of nutrition. The opportunities for constructive research seem greater in some respects than in the realm of industrial occupations, because, among other things, of the ease in duplicating occupational conditions in the laboratory and because of the different employer and worker relationship. Such studies may even contribute to the industrial problem new facts and ideals.

REFERENCES

1. Homemaking as a Center for Research. Report of the Teachers College conferences on homemaking. Planned by LILLIAN M. GILBRETH and EMMA H. GUNTHER. New York: Bureau of Publications, Teachers College, Columbia University, 1927.
2. MYERS, CHARLES S. Industrial Psychology. New York: The People's Institute Publishing Company, 1925.

3. FLORENCE, P. S. Economics of Fatigue and Unrest. New York: Henry Holt Company, 1924, Chaps. 8 and 9.
4. GILBRETH, F. G. Motion Study. New York: D. Van Nostrand and Company, 1911.
5. AMAR, JULES. The Human Motor. London: George Routledge and Sons, Ltd., 1920, Chap. 3
6. TAYLOR, F. W. Principles of Scientific Management. New York: Harper Bros., 1911.
7. BOOTHBY, W. M. and SANDIFORD, I. Basal Metabolic Rate Determinations. Philadelphia: W. B. Saunders Company, 1920.
8. BENEDICT, F. G., SMITH, H. M., and CARPENTER, T. M. Carnegie Institution of Washington. Publications Nos. 126, 216, 231, and 309. Washington: Carnegie Institute of Washington, 1910, 1915, 1915, 1922.
9. The Effects of Posture and Rest in Muscular Work. Industrial Fatigue Research Board, Report, No. 29. London: H. M. Stationery Office, Adrastal House, Kingsway.
10. LANGWORTHY, C. F. Report of Work on Energy Expenditure for Sewing and other Household Tasks. J. HOME ECON. **14,** 1922, pp. 621–625.
11. BENEDICT, F. G. The Energy Loss of Young Women during the Muscular Activity of Light Housework. *Proc. Am. Phil. Soc.* **58,** 1919, pp. 89–96.
12. CARRUTH, E. H. A Time-Study in Dishwashing. J. HOME ECON. **7,** 1915, p. 37.
13. VERNON, H. M. Industrial Fatigue and Efficiency. London: George Routledge and Sons, 1921.

OPEN FORUM

Detroit Federation of Junior Home Economics Clubs. In Detroit, Michigan, under the guidance of Charlotte Keen of Southeastern High School, the home economics clubs in the ten high schools of the city united in 1925 to form a city federation, in order to carry out more effectively their common aims and to promote interest in the state and American associations. Last year the intermediate school organizations were invited to join, so that now, with twelve clubs affiliated and others soon to join, the City Federation of Home Economics Clubs represents the activities of nearly five hundred students in this field of work. Two faculty advisors are elected alternately, every six months, for a term of one year, the new advisor taking the junior position.

At the regular meetings, held twice a term, each club is represented by one official delegate and any additional members who care to attend. Activities of the separate clubs are reported and ideas exchanged. Occasionally outside speakers add interest to the programs. In addition to the regular meetings, individual clubs now and then entertain the members of all of the affiliated groups.

Interest in the American Home Economics Association materialized in the Federation to the extent that a delegate was sent to the national convention at Minneapolis in the summer of 1926. Each club, by some original means, such as "experience parties," earned its small share of the delegate's expenses. The reports of that convention, brought back to the girls by their representative, were an inspiration and created a feeling of closer alliance with the national organization.

The Federation, by associating otherwise separated units in this work, has created a very real interest and has made a valuable contribution to the progress of home economics in our schools. The organization affords an opportunity for better acquaintance, exchange of ideas, and a more efficient functioning of a large group of girls with a common objective. It not only promotes interest in the individual clubs, but develops a feeling of home economics family relationship that brings members closer to the state and national organization.

DORIS JEAN HOLLOWAY,
Northern High School, Detroit.

A Critical Analysis of Home Economics Textbooks in Secondary Schools. Although the number of home economics books has increased rapidly within the past few years, very little has been done in the way of textbook evaluation in the field of home economics. Up to the present time, only two studies to this end have been published, and both were made prior to 1922.

In an attempt to solve the teacher's problem of the choice of a satisfactory textbook, it seemed desirable to discover which home economics books were being most frequently used in secondary schools; to check the content of these books against homemakers' responsibilities; to learn the opinions of teachers and supervisors on the characteristics desired in such books; and as a result of such studies, to establish, if possible, criteria against which home economics books might be checked to determine their value as texts in the secondary schools.

Survey of home economics books used in Minnesota schools. Analysis of 183 returns from a questionnaire sent in 1926 to teachers in the towns and cities of Minnesota, showed that 325 books were in use, 50 of these apparently being used as textbooks. In the majority of cases textbooks were furnished to the pupils by the school system.

The survey showed that the more recent books were not used to any appreciable extent, even in schools where the pupils bought their own texts. In seven departments the pupils were still having to buy a 1921 book for foods work, when there was on the market a 1924 book by the same author. Four departments were still having the pupils buy books more than ten years old, and ninety departments were having the pupils buy books five or more years old.

Analysis of the content of the twenty-one books found to be most widely used. As a step toward developing more definite standards for book selection, an analysis of the content of the twenty-one books most commonly used in Minnesota home economics classes was undertaken. A study of the proportion which was devoted in each book to each of the various phases of subject matter showed that the largest average proportion of space was given to clothing construction processes, fibers (their history, source, production, and manufacture), fabrics and their uses, home furnishings, applied design, cooking processes, recipes, and nutrition. The topics receiving the smallest average proportion of space (4 per cent or less) were marketing, care of food, food standards, table service and etiquette, patterns, home nursing and health, and selection of clothing. In five cases where the newer edition of the same book was

studied an increase in space was shown for such topics as nutrition and selection of ready-made clothing, and a decrease in the amount of space given to such topics as food composition and fibers. Approximately one page in seven was given to teaching aids, the largest amount of space being devoted to problems and questions. Approximately one page in eight was given to graphic presentation, foods books showing the smallest space allotment.

Earlier studies of textbooks and curricula have shown that the textbook content largely determines the course of study and the curriculum. It would seem, therefore, if home economics courses are to prepare girls for future homemaking, that the proportion of material on a given subject in the textbook should parallel, to some extent, the relative importance of this subject in relation to the homemaker's daily activities. From a comparison of the content of the books analyzed with the homemaker's responsibilities, it was evident that no one book included subject matter dealing with all phases of homemaking. Some important phases of homemaking, such as child care, which are performed by large numbers of girls and women, received small recognition in the books. The problem of how much space a textbook should allot to the various phases of homemaking cannot be settled until more data are available on the relative importance of various activities in the home.

Desirable characteristics for secondary school textbooks. Assuming that it is possible to use the homemaker's responsibilities as a criterion for determining the content of a home economics text-book, in 1927 a questionnaire was sent to home economics supervisors, school and college teachers and writers throughout the country to discover what characteristics were desirable in the mechanical make-up, content, and organization of the book. As earlier studies had already set up standards for the print itself, this point was not included.

An analysis of 261 replies to the questionnaire showed the characteristics desired in a textbook by the majority to be as follows:

1. Size—5 x 7½ inches.
2. Weight—average (held comfortably in one hand).
3. Cover—durable, middle value or darker color; simple, straight line design and large, plain printing; brief title printed on front cover and back of book; binding flexible enough to allow book to stay open easily.
4. Paper—slightly cream with only dressing enough to reproduce well; no imprint visible on reverse side of page.
5. Paragraphs—average length, with topical headings printed in large or bold-face type.

6. Margins—sides, ¾ inch; top, 1 inch or less; bottom, 1 inch or more.
7. Page headings—book title on left-hand page and chapter or page content title on right-hand page.
8. Footnotes—few or none.
9. Illustrations—many, each numbered and carrying a legend; black and white or some colored; one on a page or grouped to form a unit; specifically referred to in text, teaching point immediately evident, and carrying a human interest appeal.
10. Teaching helps—detailed index; table of contents with chapter headings; list of illustrations; summary at end of chapter or unit.
11. Cost—junior or senior high school, $1.25 to $1.50.
12. Origin of content—experience of author and others.
13. Preface—containing author's aim and indicating content of book.
14. Vocabulary—adapted to age of pupils; few technical terms.
15. Organization—in chapter or topic form; including suggestions for problems and projects, and questions (preferably of objective type) with answers given in text.
16. References—few; planned for pupils' use.
17. Laboratory directions—fairly detailed and located as needed in lesson.
18. Experiments—few, simple; to be performed by pupils.
19. Recipes—interpolated in text material; a few standard ones with variations; ingredients and directions listed separately.

Although there was no unanimity of opinion regarding the purposes of texts for junior and senior high schools, the general desire seemed to be to have the junior high school text touch on more phases of work and cover them less in detail than the senior high school text, the junior high school text aiming to arouse interest in homemaking activities and the senior text embodying a more definite attempt to train for future homemaking. For the senior high school group the training in the making of decisions and in the application of general principles seemed to be regarded as of considerable importance.

The writer believes that the facts brought out by this study show that it is important for a home economics teacher to analyze critically books which she is considering as texts, and then either choose two or more textbooks, the combined content of which most nearly covers the homemaking field, or procure a number of copies of several different books and thus build up a reference shelf which can be kept up to date by adding a few new books each year.

As a result of this investigation the writer feels that the following studies would be valuable:

1. Making more objective the standards for textbooks set up in this study.
2. Determining the relative importance of the homemaker's responsibilities, so that textbook writers could have a sound criterion on which to base their decisions as to the proportion of space to be devoted to the different phases of subject matter.
3. Studying the vocabulary burden of the 21 books here analyzed to test their adaptability to the age of the pupils.

ELLA J. ROSE,
University of Minnesota.

Home Economics and Other Departments in Grand Rapids Schools. Home economics has far-reaching possibilities of contributing to other school departments, and each year brings added requests and opportunities.

In the Grand Rapids public schools the special-class department, which includes such groups as the orthopedic school, conservation of sight classes, and open-air rooms, offers problems which the home economics department has helped to solve. A large number of the pupils in these special groups cannot go home for the noon meal. The home economics instructor advises as to menus and preparation of the lunch for the 100 pupils in the orthopedic school, and the home economics classes help in preparation and serving, thereby gaining experience in quantity cookery.

The sight conservation and open-air classes bring lunches from home, which are supplemented by a hot dish served at school. In order to secure cooperation from the homes, the teacher must know in advance what hot dish is to be prepared, and through food studies prepare the pupils to choose the part of the luncheon brought from home so as to make a well balanced meal.

Luncheons for the children in the nursery school are prepared in the school cafeteria, under the supervision of the director, who is a member of the home economics department. Discussions and talks on nutrition for the mothers are conducted by the home economics teachers. A unit dealing with foods for the preschool child is part of the child care work in the junior high schools. It is hoped to have the students who are taking this unit, plan and prepare the noon meal for the nursery school children, and also study their food habits.

In connection with the child care classes, certain children's garments are made. When pupils have no younger members in their own or their

friends' families, but are interested in making the garments, two children's homes furnish materials, and from 75 to 125 garments are made for the homes during the year. This work brings the girls in close touch with the little children, and interest in volunteer work for homes increases as the garments are completed.

The Parent Teacher Association has offered another opportunity for cooperation. For meetings arranged to include the lunch hour, box lunches are prepared in the regular classes and served in the school auditorium or gymnasium, the one hot dish being placed in the boxes just before they are passed. A hot drink is also served. This plan expedites service and leaves the cafeteria for the pupils undisturbed.

A question which has troubled many teachers is, "How far shall we go in making costumes for the many school affairs and still place costume making on an educational basis?" One instructor followed the plan of assigning one costume to each member of her advanced clothing class, as a class problem. It was the responsibility of each girl to study the garment to be made and proceed according to the foundation principles of garment making. The amount of time spent on finishes depended on the time allotted for the project, the number of times the costume was to be used, and the possibility of making over the garment to fill a future need. The instructor acted only in an advisory capacity, placing responsibility very largely on the pupils' judgment. Such a problem laid an excellent foundation for the advanced clothing work. When working with the less expensive material, pupils would experiment more, developing greater initiative and assurance. It was evident that the experience had an educational value, and the finished costume met very satisfactorily the theatrical demand.

HAZEL P. ROACH,
Supervisor of Home Economics,
Grand Rapids, Michigan.

Alice Peloubet Norton, 1860–1928
Editor of the Journal of Home Economics, 1915–1921

EDITORIAL

Alice Peloubet Norton. Among the group of men and women to whom the home economics movement in the United States owes its original impetus and guidance, few were more influential than Mrs. Norton. She was an active member of the first annual Lake Placid Conference of Home Economics in 1899 and a constant worker on conference committees until 1908 when it developed into the broader American Home Economics Association. At the meeting of organization of the Association, she was elected councilor at large to serve for five years, was secretary from 1915 to 1918, and editor of the JOURNAL OF HOME ECONOMICS from 1915 to 1921. Aside from these official connections, her professional work and her personal interests kept her in constant touch with developments in the home economics field.

As one looks over the proceedings of the ten Lake Placid Conferences, one realizes how much she contributed to general discussions, to the work of committees, especially those dealing with home economics in colleges and universities and with the training of teachers, during those important formative years.

The breadth of her influence as a teacher is shown by the following list of positions which she held: Lecturer on house sanitation at Lasell Seminary, 1893 to 1899; lecturer at the Hartford School of Sociology, 1894, at the Boston Y. W. C. A. school of domestic science, 1895 to 1900, at the Boston Cooking School, 1898 to 1900; teacher of domestic science in the high school and supervisor of grammar school work, Brookline, Massachusetts, 1896 to 1900; teacher at the Chicago Institute, 1900 to 1901, at the University of Chicago, 1901 to 1913. In addition, she was for many summers associated with the school of domestic science at Chautauqua, and in the years between her leaving the University of Chicago and her coming to the JOURNAL OF HOME ECONOMICS she entered another part of the home economics field, serving as dietetian in the public institutions of Cook County, Illinois.

Yet another element of Mrs. Norton's experience which made her counsel of especial value was the fact that in her own life she practised what she preached.

With this background and with her proved ability as a writer, it is not to be wondered at that she was chosen as editor of the JOURNAL OF HOME ECONOMICS when Mrs. Abel asked to be relieved from the increasing labor of the position. It is pleasant to think that her editorial ability was of national service in the Conservation Division of the United States Food Administration and that it, along with her practical experience, made her an invaluable helper with the "Thrift Leaflets" issued by the Savings Division of the United States Treasury in the months that followed the Armistice.

It is the privilege of the JOURNAL OF HOME ECONOMICS this month to devote space usually given to general editorial comment to descriptions of various phases of Mrs. Norton's work as they appear to her associates. To those who knew her, these may recall, and to those who were not so fortunate, they may at least suggest something of her breadth of vision, her practical good sense, her graciousness, and her generosity.

Mrs. Norton, a Pioneer Home Economist. Home economics needs more workers like Alice Peloubet Norton. No one can read the brief paragraph in "Who's Who" without being impressed with the notable pieces of constructive pioneer work that she had done.

She was fortunate in her ancestry and in the environment of her early life, as one of four daughters of a country pastor, in the type of home where fine thought and the simple life prevailed. At twenty-two she received the degree of A.B. from Smith College and the Phi Beta Kappa token. Later came the A.M. and three years' service as alumnæ trustee of her alma mater.

She was married at twenty-three, her husband a professor of chemistry at the Massachusetts Institute of Technology. In ten years she found herself a widow with five children. Like many others she turned to Ellen H. Richards for advice. Then began a period of studying, teaching, and lecturing.

My acquaintance with her began at this time. We taught together at Lasell and at the Y. W. C. A. in Boston, and were together at the first Lake Placid Conference in 1899.

In the summer of 1900 we were together in charge of the Chautauqua (New York) School of Domestic Science, and continued there together for about twenty years, each of us being away for a season or two. When we began there, none of the leading schools of home economics offered summer courses and we had to organize our work without guide or precedent. I sometimes wonder if leisurely college terms could have

developed us as did the stress of those summers. Certainly it helped us to deal with many later problems.

In 1900 began her work in Chicago, under Colonel Parker, which extended into Chicago University, where she was assistant professor of household administration from 1904 to 1913. Then followed an interesting pioneer experience for a year as dietetian of Cook County (Illinois) institutions.

Sometime, I hope, part of the outlines of lessons for little children which Mrs. Norton did for the University of Chicago can be found and published. They would show how in that field too she was in advance of her time.

No woman in the field today had a better training for home economic teaching than had Alice Norton in the first half of her life. Much that Mrs. Gilbreth is showing us through her home plans today, Mrs. Norton had carried out with her children, as I saw in the summers at Chautauqua.

All in all, she has left us the example of a well-rounded life—a fine illustration of the true home economist. She lived home economics.

ANNA BARROWS,
Fryeburg, Maine.

Mrs. Norton and the Journal of Home Economics. Looking back on the development of home economics in the last two decades, it seems strange that it should ever have been a debatable question that the newly organized American Home Economics Association should have a journal for expression and exchange of opinions. But the starting of the JOURNAL OF HOME ECONOMICS in February, 1909, was the result of very careful deliberaton. There was no money in sight for such an enterprise, nor any large and influential body of subscribers, and the now lucrative field of advertisement was then regarded with suspicion, for it was the era of struggle with the government over the new pure food law. Opposition to the latter was active and resourceful, and investigation of each case by a new organization without ample funds looked hopeless, while it was all-important that high standards should be maintained in the advertising columns.

But Mrs. Richards was at the helm and her knowledge behind the venture. The first number appeared in February, 1909, with no name as editor. At a meeting of the executive committee on April 24, 1909, Mrs. Abel was asked to become editor with the cooperation of the committee. She held the post until the autumn of 1915, with an issue of the JOURNAL of five numbers a year. The subscription list of 850 names was carried

in an envelope box for the season to Mrs. Richards' cottage in the White Mountains, where the neighbors, headed by Miss Alice Blood, were invited to a monthy "bee" to help address the numbers. The list of subscribers grew, the enterprise was conducted with economy, not to say parsimony, and when the first thousand dollars had been saved it was considered a good basis for a regular editorship.

I have no copy of the correspondence with Mrs. Norton, but I remember appealing to her to take the JOURNAL as a half-time job for awhile. We all knew the high regard that Mrs. Richards had for Mrs. Norton, based on a long and intimate acquaintance, and this remembered approval of our chief, I feel sure, had its influence. Her name as editor appears for the first time on the issue of October, 1915. The number of issues at at once became ten, and in 1916 twelve in the year. By then the "half-time job" had come to take the greater part of her time while the pages increased from about five hundred in 1914 to over six hundred in 1921 when she sailed to Constantinople to take charge of the home economics work at the American College for Girls.

Her intelligence and zeal seemed always at the service of the JOURNAL. I remember especially her skill in finding interesting new contributors and her unfailing tact in dealing with them. Her wide acquaintance and after 1918 her close association with government agencies were invaluable assets, while her varied experience and good judgment gave her the critical faculty equally needed by a successful editor.

MARY HINMAN ABEL,
Baltimore, Maryland.

Mrs. Norton and Constantinople College. In 1921 a department of home economics was established at Constantinople Woman's College (sometimes known as the American College for Girls at Constantinople). The American Home Economics Association had raised three thousand dollars to cover the salary of a professor for three tentative years and was asked to suggest a candidate. To the college, with its somewhat conservative academic traditions, the suggestion of Mrs. Norton was most acceptable, as she was a graduate and had served as trustee of one of the highly-esteemed eastern colleges for women, besides having a high standing in the home economics world. She was in Constantinople for over two years. The impression which she made there was never more clearly shown than at the assembly on March 28, 1928, devoted to commemoration of her life and work.

The following tribute to her services at Constantinople was paid by Professor Mary A. Hall:

Mrs. Norton became a member of Constantinople College faculty in February, 1921. We were much in need of a home economics department and were delighted at the prospect of having such an experienced and efficient organizer.

Arriving as she did after the second semester program had been arranged, Mrs. Norton could not do much academic work, so she began her services for the College by making a survey of the lycées and elementary schools in the city. Her personality and tact gained for her an easy entrance to these schools, and not only did this establish friendly relations but gave us ideas of the courses planned by them in home economics.

A new course is rather difficult to "put over" anywhere in this Near East system of education, but this new course with the element of manual training which it required had a large share of difficulties. This is a land where such work is often considered menial, and where the technique of fine hand work in domestic science is only slowly growing to be appreciated.

No one could have faced the problem with more tact and determination than did Mrs. Norton. With no proper laboratory, with the crudest sort of equipment, with few students, she was able to make "bricks without straw" and before we knew it, a creditable beginning of a home economics department was made. She left the College in June 1923, and her persistent energy, which spelled success, laid the foundation of departmental work in home economics which has grown steadily.

One of the students in her first class has since done work in home economics at Wisconsin University; another, a Turkish woman, is using her home economics experience in a very practical way in her own household.

As chairman of the Faculty Forum Mrs. Norton was most successful in getting together an interesting group of speakers and in always putting them at their best by her gracious introductions.

A third activity was giving a course of lectures to the nurses training class in the American Hospital which was then being organized in Stamboul. In numberless ways she planned and carried out many things for the comfort of the College family, and there will always be at Constantinople College the warmest appreciation and loving remembrance of her life among us.

By a happy coincidence the acting president of the college, Miss Marion Talbot, formerly dean of women at the University of Chicago, was an old friend and associate of Mrs. Norton, and the official report of her informal speech includes several points not mentioned elsewhere.

Miss Talbot said that it was characteristic of Mrs. Norton's progressive spirit that on graduating from Smith College she should join at once the newly formed Association of Collegiate Alumnæ and become an active member of its first study group, the Sanitary Science Club. This was undoubtedly an important step in her professional career, as she took an active part in the preparation by the Club of the little book "Home Sanitation," which was soon

published. Her marriage in the following year and the care of her young children did not put a stop to her intellectual activities; and when on her widowhood she was faced with the necessity of supporting her young family, it was possible for her with a small amount of special study to enter upon the career in home economics which later proved so useful as well as brilliant. Miss Talbot paid high tribute to her qualities as a mother and to the ability and devotion by which the efforts of mother and children resulted in the completion of a college course by each one of the three daughters and two sons. Chosen to direct the work in home economics in the new school founded by Mrs. Emmons Blaine in Chicago under the direction of Colonel Parker, she naturally continued the work when the Institute became a constituent part of the University of Chicago. For years she and Miss Talbot cooperated in the administration of the departments of household administration and of home economics and through this work which took up the thread of the earlier professional connection, Miss Talbot learned to value still more highly Mrs. Norton's admirable qualities. When the American Home Economics Association undertook to support for a time a chair of home economics in Constantinople Woman's College, Mrs. Norton presented more of the qualities needed in an enterprise of this kind than any other candidate in the field. Her term of office at the college was not only a happy experience for her, but was a period of valued service to the College and its constituency. Miss Talbot closed here remarks by commenting on the significance of a gathering in the Near East assembled to commemorate the life and labors of a truly noble woman.

Mrs. Norton as a Writer. Aside from her unsigned work in the JOURNAL and for the Food Administration and the Savings Division of the Treasury, Mrs. Norton was a frequent contributor to magazines and was the author of two books: "Food and Dietetics," published by the American School of Home Economics in Chicago in 1910, and "Home Sanitation" above referred to.

After her return from Constantinople she had plans for devoting her time to writing and editing. These were put aside for a year while she acted as head of the home economics department of Indiana University, substituting for her warm friend, Mabel Wellman. When later she settled down in Northampton she undertook a study for the Institute for the Coordination of Women's Interests at Smith College, and her last published work was an Institute bulletin on "Cooked Food Supply Experiments in America," which appeared in 1927. Up to within a few weeks of her death on February 23, 1928, she was actively interested in other projects of the Institute. It is pleasant to think that her special knowledge and ability thus found congenial occupation for the college of which she was so fond.

In the Proceedings of the Sixth Annual Lake Placid Conference of Home Economics appear selections from a paper entitled "Domestic Science as a Social Factor" which Mrs. Norton read twenty-five years ago before a Philadelphia meeting of the Eastern Manual Training Association. To reprint it here seems the way to show both her ability as a writer and her broad vision of what we now call home economics.

The social value of domestic science is shown, first, in its development of general social efficiency; second, in its direct influence upon home life; and, last, in its contribution to the social life of the school. We hear everywhere the cry that certain powers are too often lacking in the child of to-day, powers which are absolutely necessary for the best living.

What are the social qualities necessary for success? Control of environment; the power of initiative; a sense of personal responsibility; an appreciation of values that implies the ability to distinguish between essentials and non-essentials; an economic use of materials that includes the right expenditure of time as well as money; an appreciation of labor, and of its dignity—these are some of the qualities that make for social efficiency.

All work that implies the translation of thought into action is potent in giving control of environment. The advantage of this subject is that it deals with an environment that touches everyone closely, since it includes all the essentials of the material side of life—food and shelter and clothing.

Work in cooking develops power of initiative and individual responsibility, for each must work for himself, yet with a chance to contrast his work with that of others, and to draw a conclusion as to the results of care and skill.

The appreciation of labor is one of the most important results of work in household arts.

A class in the grades who had been washing dishes for the daily luncheon realized the amount of work involved to such an extent that they suggested five dollars a week as the sum they thought they ought to pay to have the work done for them.

The dignity of labor is also emphasized by the very fact that work of a kind often considered menial is recognized as a part of the school curriculum.

If this work tends to produce general social efficiency, it has a still more important effect on the home. The time will come when every housekeeper will be trained for the work she is to do, as much as if she were undertaking any other profession. But in educational institutions the aim of work must be, not so much the product, as the effect on the development of the individual. If the household arts do not develop character, if they do not aid in producing more efficient citizens and accomplish this better than other studies, we can hardly claim a place for them in an overcrowded curriculum. Yet the effect on the bettering of home conditions is very real. A saloon-keeper is reported to have said that nothing had hurt his business like cooking in the public schools.

In another way the home will be influenced. Many of us are afraid for the future of the home. So many centrifugal forces are working against it, life outside the home is becoming so attractive, that there is danger of the center of social interest losing its normal position in the home. The study of the household arts, if taught in the right spirit, must inevitably tend to make the home a more interesting place to each child, and this interest will engender the desire to do something in the home; and the doing will lead to a better understanding of the meaning of the home, and a deeper love for it.

No study contributes a larger social element to the school than this. If the school is indeed not merely a preparation for life but life itself, if the pupil best learns to live, not by talking about living but by taking part in supplying the needs of to-day, then the social element in the school is the essential thing. This social element is felt in the regular work. All are working for the same end, all sharing in similar processes.

Many possibilities of helpfulness offer, if opportunities are sought. In the cooking class often a double portion is prepared and hospitality extended to another grade. In many schools the study of the house has led to the construction of a play-house and each grade has shared in this, and the product been given to the kindergarten.

Many of these seem little, almost trivial things, but their influence upon the lives of the children is not small. Not only do they contribute to the life of the school the element needed to make it a real community life, but they surely lay the foundation for the future development that is not only to make of the individual an integral part of the social organism but to implant in him that feeling of social responsibility that is to be so potent a factor in the regeneration of society.

Herbert Spencer and Parental Education. The following paragraph from the chapter on "What Knowledge is of Most Worth" in Spencer's "Education" is worth reading in these days when the idea of deliberately training young people for their responsibilities as parents is so prominent and so frequently considered ultra-modern.

We come now to the third great division of human activities—a division for which no preparation whatever is made. If by some strange chance not a vestige of us descended to the remote future save a pile of our school-books or some college examination papers, we may imagine how puzzled an antiquarian of the period would be on finding in them no indication that the learners were ever likely to be parents. "This must have been the curriculum for celibates" we may fancy him concluding. "I perceive here an elaborate preparation for many things: especially for reading the books of extinct nations and of coexisting nations (from which indeed it seems clear that these people had very little worth reading in their own tongue); but I find no reference whatever to the

bringing up of children. They could not have been so absurd as to omit all training for this gravest of responsibilities. Evidently, then, this was the school course of one of our monastic orders!"

The Consumers' Club. Home economists who heard Mr. F. J. Schlink speak at Asheville a year ago will be glad to learn that a project whose modest beginnings he there described has grown to sufficient proportions to have appeared in print. This is on a circular headed "The Consumers' Club" and "First Aid to the Consumer" from which the following paragraphs are taken.

An attempt to initiate a better mode of purchasing for the great army of small consumers has been developed in the form of a series of concrete suggestions covering some of the articles of everyday life. Unlike other "aids to the consumer," this list gives names of goods by brand so that one may have the information in terms specific enough to be readily utilized at the corner store. Effective means are given for avoiding the purchase of an expensive brand article when a commonplace staple sold cheaply under its real name will do the work as well or better.

Commodities are listed in two columns, one giving those which represent, in the opinion of certain testing agencies and technical experts, good value at their price. In a parallel column appear commodities, also by name, which are not recommended, either because they cost too much, quality considered; or because they are not so suitable as other commodities in the same field; or are flagrantly misadvertised, or because the manufacturer does not give good service in replacing or repairing defective goods. . . . .

Under soaps you find a few brands that are listed as safe and inexpensive and some too costly or otherwise undesirable laundry and toilet soaps, together with a warning against paying the high price asked for castile soaps without being sure that they are not adulterated. . . . .

You will find similar help on other items such as inks, disinfectants, textiles, lubricants, maple syrup, radio sets and parts, paint and varnish, hair dyes, refrigerators, and breakfast foods; and even some advice on buying an automobile.

The list, with supplements to be issued from time to time if the experiment proves successful, is being circulated as information to members of the "Consumers' Club." Members of the Club, including many home economics teachers and experts in other fields, are asked to supply corrections wherever the data are imperfect or incomplete, and to add new information—so that the plan may be made more serviceable and may keep pace with changing market conditions. No one should join the Club expecting to find in its service a complete "guide to the market." An enormous amount of work remains to be done before any such result can be announced. Moreover, every member is

expected to assist in amplifying or correcting the listings in so far as he can, by virtue of his experience with particular commodities and firms.

The lists are for the private use of club members and their immediate families, and are not to be loaned or sold, nor may any part be published.

The dues of the Consumers' Club are $2 a year, and are used to cover laboratory and clerical expenses. No portion will accrue as profits to any individual. Whatever is received beyond the actual cost of preparing and circulating the list will be turned into a trust fund and used to carry on tests, conduct correspondence with laboratories and with manufacturers, and in other ways to extend and amplify the list and keep its information up-to-date.

The list is in its experimental stages, and although with its supplementary information it extends to thirty mimeographed pages, it does not yet cover anything like the ground which it should, if means were available for extended research. Nevertheless, it may be that this simple plan has in it the germ of a practical means for defending the consumer against the forces of supersalesmanship which so often harass and beguile him. . . . .

The technical work of the Club is under the direction of F. J. Schlink, coauthor with Stuart Chase, of "Your Money's Worth." Those desiring to join in this service, and so far as is feasible, contribute to its information, may send their dues to Stuart Chase, Treasurer, Consumers' Club, at 2 West 43rd Street, New York City.

Junior High Schools and Home Economics. Under the title "Creating a Curriculum for Adolescent Youth" a recent research bulletin of the National Education Association brings together a wealth of statistical information and expert opinion on various phases of the junior high school movement, its purposes, the content of its curricula, and the problems it presents to school boards, administrators, and teachers.

Research in junior high school home economics is the subject of a brief discussion, based mainly on recent yearbooks of the Department of Superintendence and on such studies as those with which Mrs. Kate Kinyon has been associated in Denver, Colorado, and Mrs. Annie R. Dyer at Teachers College, Columbia University. The points particularly dwelt on are what girls should gain from a course in home economics, and how this is to be determined for different communities. A list of about forty books and articles on the general subject has been brought together with the cooperation of well-known home economists from all over the country.

Perhaps of greatest interest to home economists are parts of an analysis of courses offered in 139 junior high schools, including 27 with an enrollment up to two hundred and fifty, 31 between two hundred and fifty

and five hundred, 49 between five hundred and one thousand, and 31 with over one thousand. The courses found in the curricula are divided into nine groups, under each of which are listed the courses making up the group. There are lists of elective courses offered in the schools, but nothing is said of their frequency. Figures are given, however, to show the number of schools in which courses of the various groups are required in the seventh, eighth, and ninth grades.

One of the groups of courses is designated home economics and it appears in both the elective and the required list. Home economics courses of some kind are required for the seventh grade in 97 of the 139 schools, for the eighth grade in 81, and for the ninth grade in 16. The number of pupils enrolled in the school seems to make little difference in the frequency with which courses in this group are offered, though the proportion of schools requiring home economics in the seventh and eighth grades is slightly lower among those with an enrollment of 250 or less than in the larger schools.

One of the most striking things about this analysis of courses is the names of those listed in the home economics groups. These are sewing, domestic service, cooking, domestic arts, practical arts, home economics, household arts, homemaking, and laundry—a collection of designations which hardly give a clear idea of the subject matter covered, but which show only too clearly the chaotic state of home economics terminology. It is lists like this which bring home to us the importance of the work now being done by the committee appointed by the American Home Economics Association to revise the syllabus of home economics. When the subject matter from the various fields of home economics has been systematically brought together and its application in the various parts of our educational program has been methodically studied, we may hope to have names for our courses which will tell definitely what they are, instead of using terms which mean nothing except to those who happen to know the special usage of the place where they appear. To illustrate from the figures of the bulletin in question, it is interesting to see that sewing courses rank first in frequency in the seventh grade of the 139 schools, and cooking first in the eighth grade; but what does this signify when we have no idea how much sewing and cooking the girls get from courses in domestic, household, or practical arts, in domestic science, or in the one labelled home economics?

RESEARCH

EXPERIMENTAL BREAD MAKING WITH ARIZONA SOFT WHEAT FLOUR

MARGARET CAMMACK SMITH

Department of Home Economics Research, Arizona Agricultural Experiment Station

Seventy-five per cent of the wheat produced in Arizona is the Early Baart variety. Bryan and Wood (1) reported this wheat to be especially well adapted to the irrigated lands in Arizona, and found it to be superior in yield and of better milling quality than any other Arizona grown wheat tested by the Experiment Station. Early Baart wheat was therefore selected as the soft wheat to be used for an experimental study of baking quality or strength.

Wheat or the flour milled from it is a most complex raw material to work with. Chemical analysis shows it to contain proteins, chiefly gliadin and glutenin with a proteose, leucosin, and edestin present in small amounts. Seventy-five per cent of the flour is carbohydrate, chiefly starch with a little maltose and cellulose. The ash is composed of many elements combined in a manner not clearly understood. Fat is present in the form of phosphatides resembling lecithin. Important among the enzymes are diastase which catalyzes starch hydrolysis and proteoses which accelerate proteolysis.

When water is added to the flour, the gliadin and glutenin probably combine to form gluten which forms the network in which the other materials are enclosed. Additions of sugar, salt, lard, and yeast make the dough system even more complex.

Whereas dough quality depends upon a number of relationships and interactions, the part which the flour itself plays is first to be considered. So-called "flour strength" is difficult to define. In a vague way it is thought of as its ability to produce a large well-piled loaf of bread. It is generally agreed that an actual baking test is the only reliable "quality" test and high loaf volume is considered the best indication of successful baking.

Although at the present time there is no exact chemical method for

measuring the baking strength of a flour, the relation of several factors to baking quality has been indicated. Evidence has accumulated which has thrown light upon the relation to flour strength of such diverse factors as total protein content, gluten quality and quantity, gliadin-glutenin ratio, hydration capacity, viscosity of the suspension, and diastase content.

Measurements of some of these chemical and physical factors in flour milled from Arizona Early Baart wheat were first made for the purpose of gaining information on the inherent baking strength of the flour.

A moisture content of 12.53 per cent as determined by the Official method gave the basis for calculation of the other constituents upon a moisture basis of 15 per cent, that now being the moisture content of flour permitted by the United States Pure Food and Drugs Act.

A percentage acidity of 0.098 per cent calculated as lactic acid indicated that sound wheat was used and is probably without further significance.

The ash content (0.61 per cent), again determined by the Official method, was found to be high for a soft wheat of the same milling grade.

A total crude protein content of 9.84 per cent obtained by the Gunning, Arnold, Dyer modification of the Kjeldahl method, using the conversion factor of 5.7 for wheat proteins, places Early Baart in the better class of soft wheats and perhaps as a semi-hard wheat.

Upon separation of the crude gluten, using Dill and Alsberg's (2) 0.1 per cent sodium phosphate solution to wash out the starch, a creamy colored, elastic, soft but not sticky gluten was obtained, which was somewhat lacking in desired toughness.

The ratio of wet gluten to the material dried to constant weight in a Freas electric oven evidenced a relatively high hydration capacity, the dry gluten absorbing $2\frac{1}{2}$ times its weight of water.

Separation of the glutenin, gliadin, and salt soluble proteins by the methods of Bailey (3), and Sharp and Gortner (4) gave a gliadin-glutenin ratio of 0.402, a ratio which, as shown by Bailey (3), probably lacks special significance.

A quantitative determination of the diastatic activity of the flour by the method of Rumsey (5), and of the reducing sugars by the method of Quisumbing and Thomas, giving a value of 180 mgs. of maltose per 10 grams of flour, showed the presence of but a fair amount of the diastatic ferment.

Though none of the above-mentioned physical and chemical measurements in themselves measured the strength of Early Baart flour, never-

theless each made some contribution and collectively they showed that this flour ranks high as a soft wheat.

Whereas the factors which determine "strength" or "quality" are to a large extent pre-existent in the flour, the baker can modify this quality to a considerable extent through his control of the bio-chemical changes occurring during the bread making process. The dough forms a most complex colloidal system. Herein lies the baker's power, for by proper handling of the dough, and adjustments of formula, he can exercise control over the environment of the colloidal particles. Among the environmental conditions affecting colloidal behavior may be mentioned hydrogen-ion concentrations, temperature, presence or absence of electrolytes, and enzyme activity (protein) which modifies the protein structure.

The physical or chemical changes produced in the dough during the fermentation process which are correlated with the so-called "gluten ripening" or "maturing" process are not definitely known. Most of the evidence at hand, however, suggests that change in a H-ion concentration is involved, and is perhaps of prime importance. Jessen-Hansen (6) was the first to point out the importance of H-ion concentration in bread making. He stated that "for the dough of any wheat flour, there exists a determined concentration of hydrogen ions with which the production of bread from this flour will be most successful." He found that the largest loaf volume and bread of the best quality were obtained when it was fermented until the acidity was represented by a H-ion concentration of 5. Later workers have shown that at about this concentration, the rate of yeast activity reaches a maximum, flour and malt diastase show their greatest activity, and rope-producing organisms are almost inactivated. Whether the accumulation of H-ion exerts a favorable effect upon the gluten, or whether it functions advantageously through its stimulating effect upon enzyme action, the correlation of optimum acidity conditions with good bread production is an established fact.

As flours have an initial H-ion concentration of about 6, the change to pH 5, the H-ion concentration which is usually associated with the best bread production from a given flour, involves a considerable increase in acids during fermentation. The rate at which a dough changes in H-ion concentration varies with the flour. Some flours never reach the optimum pH in a normal fermentation period and others reach it but slowly. The resistance which a flour offers to change in acidity depends upon the degree to which it is buffered.

The pH of a 1–10 suspension of Early Baart flour as determined electrometrically, using a type K, Leed and Northrup potentionemeter with calomel half cell and a Bailey hydrogen electrode, was 6.07. Eight and one-half cc. of N/50, Hcl being required to lower the pH of 100 cc. of a 1–10 suspension of the flour from 6.07 to 5 indicated a relatively high buffer value for this soft wheat flour and predicted the necessity of a longer fermentation period in order to realize optimum acidity conditions.

In all the experimental baking, Early Baart flour, distilled water, compressed yeast, cane sugar, commercial salt, and lard were the ingredients used. For each loaf 325 grams of flour, and 2 per cent of this weight of lard and salt were used. The percentages of yeast, water, and sugar were subject to experimental variation.

Mixing of the dough ingredients was accomplished in 10 minutes by means of an electric mixer with a special dough hook attachment making 46 revolutions per minute. The dough was fermented in Chidlow expansion jars, placed in a thermostatically controlled electric cabinet with a temperature of 82°F. Punching of the dough consisted in knocking it several times against a marble surface. Further handling was found unnecessary. The dough was allowed to rest (bench proofed) 15 minutes before being flattened into pans of recommended dimensions and pan proofed at 92°F.

The bread was baked in an evenly heated electric oven also with thermostatic control. Experiment showed that superior results were obtained when the dough was allowed to finish its rising in the oven during a 10-minute period after which time the oven temperature was raised from 350° to 410°F. for 25 minutes. A humidity control was provided at all stages of the bread-making process.

The 24-hour bread was weighed and measured in a loaf-measuring device employing the seed displacement principle before being cut and scored. As a guide to obtaining the correct fermentation period, the pH value of the bread was recorded in every case.

EXPERIMENTS USING STRAIGHT-DOUGH AND SPONGE METHODS

Variation in the Proportion of Water Used. The results of varying the proportion of water between the limits of 50 and 66 per cent indicated an absorption of 58 per cent as the most satisfactory. The use of 2 to 4 per cent more water resulted in loaves of somewhat larger volume, but this advantage was offset by an accompanying lower texture score. Further increases resulted in a dough too sticky to be handled comfortably. The

volume of the resulting loaf was smaller due to the lack of ability of the too slack dough to retain the gas. A light colored crust, flat top, coarse uneven grain, and rather heavy texture were accompanying characteristics. With the stiffer doughs, the loaf volumes were lower and the bread grain fine and cake-like. A cracked, shell top resulted from the use of too small amounts of water, showing too great a resistance being offered to the expanding gases when placed in the oven. The advantage of the soft dough in the handling of this soft wheat flour was probably due to the more vigorous fermentation which followed.

Variation in the Percentages of Yeast and Sugar. In order to determine the proportion of yeast and sugar which was best adapted to good bread production from Arizona soft wheat flour, the percentages were varied within rather wide limits, the other constituents of the formula being used in constant amounts. (Table 1).

TABLE 1

Results of baking experiments with variations in percentages of yeast and sugar in the formula (dough doubling in bulk in jar and proofed 2½ times bulk in pan)

FORMULA		TOTAL FERMENTATION TIME	VOLUME OF LOAF	SCORE FOR TEXTURE	H-ION CONCENTRATION IN BREAD
Yeast	Sugar				
per cent	*per cent*	*minutes*	*cc.*	*per cent*	*pH*
2	3	135	1,785	80	5.41
3	3	125	1,795	80	5.40
3	4	120	1,820	84	5.36
4	3	115	1,810	83	5.32
4	4	105	1,820	86	5.30
4	6	100	1,880	88	5.29
6	4	90	1,900	84	5.28
6	6	80	1,925	82	5.25

The results, as given in table 1, show that the increase in volume of bread with increasing percentages of yeast and sugar was quite apparent. With the exception of the very rich formula, i.e., high percentage of yeast and sugar, a corresponding ascending texture score made it evident that the larger volumes were not obtained at a sacrifice of other desirable bread qualities. This was not the case, however, with the bread in which the very rich formulas were used. The lower texture scores of these loaves were due to their over-light characteristics and sweet taste.

Increasing the percentage of yeast without a corresponding increase of the food material (sugar) upon which it is to act, however, did not result in a compensatory improvement in bread quality. That the fer-

mentation rate became more vigorous as the percentage of yeast and its substrate sugar was increased in the formula, was evidenced by the lessened time required to reach the given volume and the increase in acidity.

Variation in Extent of Fermentation. Though the more vigorous fermentation resulting from the use of more yeast and sugar in the previous experiment was accompanied by a greater development of acidity, in no case had the H-ion concentration reached pH 5. A greater increase in H-ion concentration was apparently necessary to overcome the natural buffers of this flour. This fact, coupled with the observations of a yellow crumb color associated with underfermentation, led to an extended study of the relation of fermentation time to bread quality.

TABLE 2

Results of baking experiments with variations in number and extent of fermentation periods, in breads made by straight-dough method with 3 per cent yeast and 4 per cent sugar

NUMBER OF RISING PERIODS	VOLUME INCREASE IN EXPANSION JAR			TOTAL INCREASE IN PAN	TOTAL FERMENTATION TIME	VOLUME OF LOAF	TEXTURE SCORE	H-ION CONCENTRATION IN BREAD
	First rising	Second rising	Third rising					
				times	*minutes*	*cc.*	*per cent*	*pH*
1				2¼	80	1,620	70	5.43
2	Double			2½	120	1,820	84	5.36
3	Double	Double		2½	150	1,940	89	5.26
2	Maximum			2½	150	1,950	88	5.26
3	Double	Maximum		2½	220	1,900	84	5.21
3	Maximum	Maximum		2½	250	1,800	80	5.16
4	Double	Double	Double	2½	225	1,820	82	5.20

As shown in table 2, a short fermentation consisting of but one rising period before pan proofing gave results markedly inferior to a longer fermentation period, while too great a prolongation of the fermentation period resulted in reduced loaf volume even though it was apparent that the increase in H-ion concentration had not been carried beyond the optimum point. It would seem, therefore, that a factor was involved other than that of reaching a certain H-ion concentration.

A study of the relation of formula to fermentation time (table 3) showed less decrease in loaf volume with prolongation of fermentation time when the higher sugar formula was used. This suggested that the more rapid falling off in volume with the prolongation of the fermentation period when the leaner formulas were used might be due to a partial exhaustion of the yeast food (sugar) in the last stages of the fermentation process. The somewhat lower pH values obtained when the high sugar

formulas were used did not explain the greater loaf volumes, for greater acidity was obtained when leaner formulas were used, and yet the bread volumes and qualities were inferior. Good loaf volume is known to be dependent upon gas production as well as upon gas retention. Though a more nearly optimum acidity may be reached by extending the fermentation time, it is evident that an accompanying exhaustion of yeast food would prevent the carbon dioxide production necessary for securing bread of high volume and quality.

According to Rumsey (5), yeast depends for its initial food upon the added sugar, but in the last stages of the fermentation process it becomes largely dependent upon the sugars formed by diastatic activity. Hence

TABLE 3

Relation of formula to fermentation time in baking experiments with bread made by straight-dough methods

FORMULA	NUMBER OF RISING PERIODS	VOLUME INCREASE IN EXPANSION JAR			VOLUME INCREASE IN PAN	TOTAL TIME OF FERMENTATION	VOLUME OF LOAF	SCORE FOR TEXTURE	H-ION CONCENTRATION IN BREAD
		First rising	Second rising	Third rising					
					times	*minutes*	*cc.*	*per cent*	*pH*
Yeast 4% Sugar 6%	1				2½	75	1,690	74	5.36
	2	Double			2½	100	1,880	88	5.29
	3	Double	Double		2½	150	1,980	91	5.22
	4	Double	Double	Double	2½	210	1,960	88	5.13
Yeast 2% Sugar 3%	1				2½	90	1,580	68	5.46
	2	Double			2½	135	1,785	80	5.41
	3	Double	Double		2½	195	1,820	85	5.30
	4	Double	Double	Double	2½	240	1,740	80	5.19

it would seem that a method of handling of flour which would promote diastatic activity would result in better aeration of the dough in the proofing and correspondingly greater oven spring and superior bread quality. Again Rumsey (5) has pointed out that the H-ion concentration at which flour diastase exhibits its maximum activity is never reached in a stiff dough in a normal fermentation period. The sponge method of bread making, in which only a part of the flour is mixed with all the liquid and yeast in a "prefermentation" or sponge period, provides a slack condition conducive to more rapid increase in H-ion concentrations and therefore of diastatic activity.

Due to lack of space, tables of results of numerous experiments employing the sponge method are not included. The development of acid in sponge periods of different length was investigated. Increasing the

sponge time by half-hour intervals from 30 minutes to 12 hours resulted in a gradual but pronounced increase in sponge and bread acidity. Too long a prolongation of sponge time was contra-indicated. Destructive proteolysis and excessive loss of dry material were negligible in the shorter-time sponge bread and the 2-hour sponge period was found to be optimum from all standpoints. Experimental variation of the extent of fermentation after sponge periods of from 30 to 120 minutes were carried out, and the relations of sponge time, length of fermentation after sponging, and formula were studied. A summary of some of these experiments is included in table 4.

That the sponge method was superior to the straight-dough method for Early Baart flour was strikingly evident. Not only were larger loaves of bread obtained from the same amount of material, but the loaves were better piled as well, the sponge-process bread being notably softer and silkier in texture and finer and evener in grain than the harsher, thicker-cell-walled straight-dough product. Thus, in every case in which the extent of rising in the expansion jar, that is, the length of fermentation period, and the formula were similar, the sponge bread received the higher score.

As the number or length of fermentation periods increased, the pH values of the bread steadily but slowly dropped; the bread volume and texture scores, however, reached their maximum value when the dough had been allowed to double its bulk twice. Further fermentation, in spite of the accumulation of H-ions, caused the loaf to have less oven spring and a correspondingly smaller volume. This was less apparent with the longer sponge period and the higher sugar formula. Again, it is evident that differences in bread quality resulting from formula variation are far more striking than differences resulting from a variation of sponge time or of the extent of the subsequent rising period. Regardless of the time of sponging or extent of fermentation after sponging, the higher yeast and sugar formula resulted in the best bread production. Regardless of differences of method of this kind, the 4 per cent yeast and 6 per cent sugar formula produced superior bread. It may be noted also that the use of a leaner, less expensive formula (4 per cent sugar) with the sponge method gave bread of even better quality than that obtained by the high sugar (6 per cent) formula with the straight-dough procedure.

Undoubtedly the advantage which the sponge method possesses over the straight dough method lies in the more rapid increase in H-ion concentration in the slack sponge. The benefit derived from increased

TABLE 4

Summarized comparison of straight-dough and sponge methods in baking experiments with breads

FORMULA	METHOD	VOLUME INCREASE IN EXPANSION JAR			TOTAL FERMENTATION TIME	VOLUME OF LOAF	TEXTURE SCORE	H-ION CONCENTRATION IN BREAD
		First rising	Second rising	Third rising				
					minutes	*cc.*	*per cent*	*pH*
Yeast 2% Sugar 3%	Straight dough	Double			135	1,785	80	5.41
	30 min. sponge	Double			150	1,800	83	5.25
	60 min. sponge	Double			180	1,830	85	5.22
	120 min. sponge	Double			265	1,860	88	5.19
	Straight dough	Double	Double		195	1,820	85	5.30
	30 min. sponge	Double	Double		200	1,840	87	5.19
	60 min. sponge	Double	Double		235	1,850	89	5.17
	120 min. sponge	Double	Double		300	1,890	91	5.14
	Straight dough	Double	Double	Double	240	1,740	80	5.19
	30 min. sponge	Double	Double	Double	275	1,780	83	5.12
	60 min. sponge	Double	Double	Double	300	1,800	83	5.10
	120 min. sponge	Double	Double	Double	350	1,825	85	5.06
Yeast 3% Sugar 4%	Straight dough	Double			120	1,820	84	5.36
	30 min. sponge	Double			140	1,870	87	5.23
	60 min. sponge	Double			160	1,905	89	5.18
	120 min. sponge	Double			220	2,010	92	5.12
	Straight dough	Double	Double		150	1,940	89	5.26
	30 min. sponge	Double	Double		180	1,960	91	5.16
	60 min. sponge	Double	Double		215	2,005	94	5.12
	120 min. sponge	Double	Double		275	2,040	97	5.10
	Straight dough	Double	Double	Double	225	1,820	82	5.20
	30 min. sponge	Double	Double	Double	220	1,860	84	5.10
	60 min. sponge	Double	Double	Double	260	1,900	86	5.06
	120 min. sponge	Double	Double	Double	325	1,920	88	5.02
Yeast 4% Sugar 6%	Straight dough	Double			100	1,880	88	5.29
	30 min. sponge	Double			135	2,020	91	5.21
	60 min. sponge	Double			155	2,045	93	5.15
	120 min. sponge	Double			215	2,070	94	5.12
	Straight dough	Double	Double		150	1,980	91	5.22
	30 min. sponge	Double	Double		165	2,030	93	5.15
	60 min. sponge	Double	Double		210	2,080	95	5.08
	120 min. sponge	Double	Double		290	2,110	98	5.04
	Straight dough	Double	Double	Double	210	1,960	88	5.13
	30 min. sponge	Double	Double	Double	210	1,970	90	5.07
	60 min. sponge	Double	Double	Double	255	2,000	92	5.05
	120 min. sponge	Double	Double	Double	310	2,065	93	5.00

acidity is at least partially due to a more vigorous diastatic activity which resulted in the formation of increased amounts of sugar available for yeast food in the last stages of the fermentation process. With no lack of gas production, better aeration and therefore larger loaf volumes were possible. Bailey (7) believes this to be a prime factor in good bread production and increase in H-ion concentration benefits in this respect rather than in improving physical characteristics of the dough.

The so-called "gluten ripening" process is not so definitely indicated or understood. The view that the gluten becomes more elastic as it approaches its iso-electric point at pH 5, is no longer tenable in light of more recent information which places the iso-electric point of gluten proteins in the neighborhood of pH 6. An apparent increase in gluten extensibility, however, was noted in this work. The volume of maximum expansion was always greater in the second rising period than in the first. It seems probable that increased acidity accompanied by greater solution and dispersion of the colloidal gluten as it was carried farther away from its iso-electric point would result in greater attenuation of the tough gluten strands. The thinner celled wall would then become more easily distended by the expanding carbon dioxide gas, thus making possible bread of larger volume and superior texture.

FURTHER EXPERIMENTS

Before attempting to apply the results obtained under laboratory processes to commercial practices, additional experiments were carried out which can only be summarized here.

Effect of Using Tap Water. Using the formulas and methods found most satisfactory in the previous work, the effect of tap water from the local supply of the University of Arizona was compared with distilled water, the water being the only variable in the baking tests. Analysis of the tap water showed it to contain 7.5 parts per billion of calcium, 11.25 of magnesium, 92 of sodium, 95 of sulfate, and 176 of bicarbonate, and that its H-ion concentration was pH 7.92. A smaller loaf volume of lowered acidity was consistently obtained.

Effect of Adding Flour Improvers. The use of flour-improving agents is becoming widespread. Some are acids or acid salts which increase the initial H-ion concentration of the dough, thus enabling it to maintain a higher acidity level throughout than would otherwise be possible. Others are mineral salts which act as yeast foods, thereby stimulating yeast activity.

A few experiments in which lactic acid was added to Early Baart flour showed a resulting improvement in bread volume. Again, however, with the longer fermentation period, lack of residual sugar was a limiting factor. It seemed also as though addition of acid in this manner was less effectual than the acids produced in the usual course of fermentation.

A more extended study was made of the use of .003125 per cent of a common commercial mixture of the mineral salts, ammonium chloride, calcium sulphate, and small amounts of potassium bromate. With the shorter fermentation doughs larger volumes were obtained when this mixture was used and the loaves were of finer texture and color. With longer sponge periods, however, the mineral mixture had a deleterious effect, the resulting loaves being smaller in volume, darker in color, and possessing the characteristics of "age." The effect of the use of the mixture appeared to be the more rapid development of acidity rather than an increase in the initial acidity. Undoubtedly an intelligent use of such a mixture has a great advantage. However, the fermentation period must be carefully controlled or "old" bread will result. The span of good bread production is materially decreased and the danger of extending the fermentation period too far is great.

High-Speed Mixing. Recent work by Swanson (8) has shown that "it is so possible to modify dough by mechanical means that light bread can be baked using only the fermentation in the pan." By means of a high-speed mixer with the pack-squeeze-pull-tear type of motion, gluten strands have been separated and elongated and have lost some of the toughness with an increase in the elastic limit. This work suggested that such a mechanical development might be successfully used with Early Baart flour to assist the maturing action of the increasing H-ions resulting from yeast fermentation. The fermentation time might then be definitely reduced as the dough would become more expanded and, therefore, reach the desired volume more quickly. With the use of the mineral mixture above described to further the increase in acidity with its probable beneficial effect on both the colloidal behavior of gluten and upon diastatic activity, it would seem probable that the marked advantage which the sponge method possesses over the straight dough might be offset.

By increasing the speed of mixing from 46 to 152 revolutions per minute, and by using a mixing paddle with a movement more nearly like that described by Swanson than was obtained by the dough hook used in the foregoing experiment, the effect of mechanical action upon the gluten of Early Baart flour was investigated.

The volume of the bread receiving this treatment was somewhat greater, the texture was silkier, the resulting bread compared favorably with the best sponge bread. The time required to reach the desired volumes in the expansion jar and in the pan was materially less. A lessening of time is a matter of commercial importance both from the standpoint of labor charge and also through the saving of dough material. The latter fact, coupled with the higher absorption that can be used with high-speed mixing, means a greater yield in pound loaves per barrel.

Effect of Commercial Treatment. As the treatment afforded a bread dough in an experimental baking laboratory is of necessity different from that in commercial bakery, the question of applicability of the results obtained under laboratory conditions with Early Baart flour to commercial practices was still unsolved. Baking of the Early Baart flour on a large scale under the commercial conditions of a local bakery was tried out.

In the first trial, the 2-hour sponge method with 4 per cent yeast and 6 per cent yeast and 6 per cent sugar in the formula was followed, the stiff dough being allowed to double its bulk twice before the proofing period. In the second trial the straight-dough method, which is perhaps better suited to commercial practice, was used. The mineral mixture was used to hasten the development of acidity, the formula and method of procedure being otherwise identical with the above. Both doughs were subjected to the usual commercial machinery, mixing machine, divider, etc., and handled by the bakery employees in their usual manner.

Loaves of superior quality were obtained with a bread yield of 300 pound loaves per barrel of flour. The success of the experiment assured the practicability of Early Baart flour for bread making under commercial conditions. The mixer used was a low-speed mixer of the old type and it is to be expected that the results with high-speed mixing will prove even more satisfactory both from the standpoint of bread quality and bread yield.

Conclusion. From the results of physical and chemical tests and baking experiments, in which control was exercised over the many factors involved in bread baking, it may be concluded that Arizona Early Baart flour possesses such qualities as are conducive to good bread production.

A vigorous fermentation obtained by the use of 4 per cent yeast, 6 per cent sugar, and a preliminary 2-hour sponge period, after which the dough was allowed to double its bulk twice before pan proofing, resulted in bread of excellent quality.

REFERENCES

1. Bryan, W. E. and Wood, C. J. Early Baart Wheat. *Arizona Agricultural Experiment Station. Timely Hint for Farmers No.* **141** (1922).
2. Dill, D. B. and Alsberg, C. L. Some critical observations of the gluten washing problem. *Cereal Chem.* **1,** 222–246 (1924).
3. Grewe, E. and Bailey, C. H. The concentration of glutenin and other proteins in various types of wheat flour. *Cereal Chem.* **4,** 230–347 (1927).
4. Sharp, P. F. and Gortner, R. A. Viscosity as a measure of hydration capacity of wheat flour and its relation to baking strength. *Minnesota Agricultural Experiment Station. Tech. Bull.* **19** (1923).
5. Rumsey, L. A. The diastatic enzymes of wheat flour and their relation to flour strength. *Am. Inst. Baking Bull.* **8,** (1922).
6. Jessen-Hansen, H. Studies in wheat flour. I. Influence of the concentration of hydrogen ions in the baking value of flour. *Comptes-rendues des travaux. Lab. de Carlsberg* **10,** 170–206 (1911).
7. Grewe, E. and Bailey, C. H. Relation of hydrogen-ion concentration of dough to baking properties. *Cereal Chem.* **4,** 261–270 (1927).
8. Swanson, C. O. and Working, E. B. Mechanical modification of dough to make it possible to bake bread with only the fermentation in the pan. *Cereal Chem.* **3,** 65–83 (1926).
9. Swanson, C. O. A theory of colloidal behavior in dough. *Cereal Chem.* **2,** 265–275 (1925).

BOOKS AND PERIODICALS

NEWS BOOKS

Nutrition. By WALTER H. EDDY. Baltimore: The Williams & Wilkins Company, 1928, pp. 221, $2.50.

The reviewer is tempted to advise a reader to begin Eddy's Nutrition in the middle of the volume. The second part of the book contains an interesting, valuable presentation of vitamins. It starts with a bit of the history of the subject and follows in a few paragraphs with a summary of chief points of our knowledge of A, B (including its two or possibly three components), C, D, E, and "other vitamins" up to the time of writing. Then comes a fairly detailed description of experimental method and, most significant, a chapter based largely on work in the author's own laboratory and entitled, "How Does Cooking Affect Vitamin Values?"

This half of the book is of interest both to the student with some background in nutrition and to the layman with a curiosity about present day vitamin work.

Part one, which deals with general food requirements, is not quite so satisfactory, either in scientific content or in manner of presentation. The chapters on proteins and on inorganic nutrients seem to the reviewer to be the most interesting of this part; the section on energy requirement lacks the vividness of presentation and the human significance that one wishes in a popular book on nutrition.

The author of the book thus states his purpose, a purpose well attained in the second half and somewhat unevenly in the first: "The main object has been not to write a guide to correct eating, as one compiles a book on etiquette, but to try to express in simple language the process and the problems in the field of nutritional science today."

KATHARINE BLUNT,
University of Chicago.

Infancy and Human Growth. By ARNOLD GESELL. New York: The Macmillan Company, 1928, pp. 418, $6.00.

This book deals with the development of intelligence as a factor of human growth. Although other characteristics of the child's behavior are discussed, the main topic of the book is the progressive unfolding of intelligence, with the discussion of factors influencing such development. There are three parts and twenty chapters.

The first chapter contains a general discussion of mental growth and the author attempts to show that the factors of mental growth must be dealt with in biological terms. Throughout the book biological factors and the close relationship between psychological and biological development in general are clearly illustrated.

The first four chapters and part of the fifth are concerned with methods of study. There are many excellent pictures of the laboratory, and a number of illustrations of specific apparatus. The reader obtains a clear view of the meaning of an experimental laboratory from the convincing manner in which laboratory technic and the meaning of an experiment are outlined.

The greater part of the following chapters gives a schedule of the intellectual development of infants and children. There are also several chapters on special phases of development such as the factor of drawing as a developmental index, glandular and nutritional factors in intellectual development, twinning, premature infants, and abnormal development.

The last few chapters are concerned with a general discussion of the biological growth of the human infant, the relation of maturation to development, and the predictive value of an exact examination. The chapter on clinical prediction of mental growth will be especially useful to students. The con-

cept of psychological growth as a biological phenomenon is clearly set forth.

The discussion of methods of examination and of the various influencing the factors development of intelligence and personality growth in general will probably be of great value to the student of home economics. As the author clearly brings out, the knowledge of the growth curve of the infant or child will be of great aid in the future treatment of that child. The intelligence scale for infants is quite clear and discriminative and may be easily utilized by any serious worker even though he has not had any special psychological training.

There are very few discrepancies in the logic of the book until the seventeenth chapter is reached. Here the author appears to vacillate between very modern psychological viewpoints and the attitudes of the older medical man. He attempts to prove inborn tendencies of children as to temperament, whereas "inborn tendencies" have been gradually discredited by modern experimentalists. The statement "With the same home, with the same mother, similar physical health, it is highly probable that these differences in emotivity bespeak an inherent, even inborn, difference in temperamental make-up," may be strong proof of such "inborn" differences, but the author has not proved that he has adequate data.

The discussion dealing with maturation presents evidence which is not conclusive. The author assumes, for example, that the development of similar traits in the majority of normal infants and the progressive unfolding of intellectual traits are strong proof for the theory of maturation. "If it (maturation) did not exist the infant would be a victim of a flaccid malleability which is sometimes romantically ascribed to him. His mind, his spirit, his personality, would fall a ready prey to disease, to starvation, to malnutrition, and worst of all, to misguided management." "Flaccid malleability" is, however, a characteristic which no modern psychologist would deny, and the possibilities of the child falling a prey to disease, misguided management, and so on, are too well known to be set aside by a sweeping statement.

The book is, on the whole, very readable and extremely informative.

MANDEL SHERMAN,
Washington Child Research Center,
Washington, D. C.

Junior Home Problems. By KATE W. KINYON and L. THOMAS HOPKINS. Drawings by CLARA ATWOOD FITTS. Chicago: Benj. Sanborn & Co., 1928, pp. 214, $1.00.

This little book has filled me with the greatest satisfaction. Now indeed has home economics found its place in the modern junior high school. Away with samples of patches and darns, cabbage salad and cleaning sinks; education is not preparation for life—it is living! For a long time it has seemed that when geography, mathematics, and Latin could be made such vital projects to adolescents something more might be done for cooking and serving and housekeeping courses. The girl at junior high school age is deeply concerned with her own place in the scheme of things,—ego-centric, yes, but idealistic too, and eager to work for the common good. And it is because it makes use of this approach that there is vitality, as well as a sound psychological basis, in the course planned here.

The course aims to develop a conscious attitude in the girl with regard to her own family and home relationships and through these to the larger community life. She is led to make and to enjoy her place there, to accept her responsibilities, to make her contributions. She is helped to see that her own satisfactions come from meeting squarely her problems. What could better fire the imagination and give point to acquiring skills, habits, underlying principles—even to taking her minor place as home helper rather than homemaker?

Technically speaking, the subject matter is organized on a unit basis, with sufficient material for five sixty-minute periods each week for one half-year. The units cover family relationships, budgeting, housekeep-

ing skills, care of children, home care of the sick, entertaining at home, and relationship of home to community.

As a former teacher I am impressed with the arrangement and development of the subject matter, the helpfulness of the questions and problems suggested, the pertinent reference lists for both pupils and teachers. As a parent I rejoice in the real help such a course will be to our daughters and ourselves in our endeavors to build successful homes.

HARRIET R. HOWE,
Washington, D. C.

Negativism of Pre-School Children. An observational experimental study. By MARTHA MAY REYNOLDS. New York: Bureau of Publications, Teachers College, Columbia University, 1928, pp. 126, $1.50.

The report of research undertaken to discover the manifestations of negativism in young children, its forms, and the relation of these factors to mental and chronological age. No attempt is made to name causes for or dictate methods of handling negativistic children, but the discussion nevertheless throws much light on a problem of real concern to both parents and teachers.

A Book of Food. By P. MORTON SHAND. New York: Alfred A. Knopf, 1928, pp. 319, $4.00.

A book about good food by a widely travelled Englishman with French affiliations who is more interested in everyday meals than in the masterpieces of the professional caterer. Despite a wide catholicity of taste, he makes no apologies for personal likes and dislikes and includes among the latter most things American. The volume is a mine of information on local dishes and delicacies but unfortunately lacks the index that would allow the reader to work it easily.

Lucullus or the Food of the Future. By OLGA HARTLEY and MRS. C. F. LEYEL. New York: E. P. Dutton & Company, 1928, pp. 77, $1.00.

An ingenious and amusing if not always convincing prophesy of what mankind may come to in the matter of food supply and habits, much of it put into the form of a lecture broadcast as "some distantly future date" by Professor Lucullus, F. R. S. His remarks on the neo-vegetarians of the twentieth century, the alternative diet supplied by scientists as a result of strikes organized by the International Agricultural Workers Union, and the waste of windpower and water, including the shocking neglect in the matter of training fish to take care of their young, indicate the general trend of the author's argument.

Recipes for You. By MARY MACKIRDY. London and Glasgow: Wm. Collins Sons & Company, Ltd., pp. 322, 3s. 6d.

A great variety of well-stated recipes which, in reflecting English usage, invite comparisons with American dishes and menus and suggest variations in those prevalent in this country.

Kitchen Management. Construction, planning, administration. By K. O. DAHL. New York: Harper & Brothers, 1928, pp. 364, $5.00.

The modern hotel, restaurant, or institutional kitchen, its arrangement, equipment, and management, discussed by an experienced administrator and writer on such subjects. Many practical suggestions, plans, tables, and illustrations are given, which should make the book of value to those concerned with the planning of institutional kitchens or with work in them.

Town and Country. By ELVA E. MILLER. North Carolina: University of North Carolina Press, Chapel Hill, 1928, pp. 212, $2.00.

The last work of a highly esteemed southern agricultural editor in which he develops the idea of the interdependence of town and country and the importance of recognizing it in any program of rural or urban betterment. Cases are cited of the prosperity of communities whose leaders realize that the business development of the country town depends on the buying and selling power of the farmers using it as their

center and who foster a policy of cooperation between the two. In the author's opinion the future of town and country alike depends on such mutual understanding and goodwill.

Rusticus or the Future of the Countryside. By MARTIN S. BRIGGS. New York: E. P. Dutton & Co., 1928, pp. 94, $1.00.

The historical development, present dangers, and future possibilities of the English countryside as they appear to a widely-travelled architect. Systematic planning seems to him the means by which the beauty and quiet of the country can be preserved without unduly checking the town-dweller's legitimate desire for easier access to attractive rural regions. The brief history of English roads brings out several interesting points, for example, the brief duration of the much-vaunted coaching days. A pleasant book for lovers of rural England and suggestive for friends of rural life everywhere.

The Human Habitat. By ELLSWORTH HUNTINGTON. New York: D. Van Nostrand Company, Inc., 1927, pp. 293, $4.50.

Human geography for the layman by a leader in the American school of that science, already known as a stimulating writer on the subject. Emphasizes certain main phases of the subject and does not attempt to cover the whole field. Begins with an ingenious description of "the terrestrial canvas" and the distribution of different climatic and topographical conditions, and then enlarges somewhat on their effects on human development with interesting, actual examples, and discusses the reasons for the contrasts of cultures found in different regions and periods. Contains sections of interest to students of manners and customs and of the history and economics of food, clothing, and shelter.

Fixation of Atmospheric Nitrogen. By FRANK A. ERNST. New York: D. Van Nostrand Company, Inc., 1928, pp. 154, $2.50.

A book not so much for the trained worker as for the general reader seriously interested in the problems presented by fixation of atmospheric nitrogen. Includes brief discussion of the necessity for and sources of nitrogen, the development of the nitrogen industry, the three present commercial processes, and the place of the industry in world economy.

Standards Yearbook, 1928. Department of Commerce. Compiled by the National Bureau of Standards. Bureau of Standards Miscellaneous Publication No. 83. Washington, D. C.: U. S. Government Printing Office, 1928, pp. 399, $1.00.

The second issue of the yearbook. In addition to the organization and procedure of standardizing agencies in this country and abroad which were noted in the previous issue, this year's volume contains outlines of the activities of federal, state, and local public agencies and of technical and trade bodies and their work in standardization. It further includes a bibliography of the subject prepared in the Library of Congress.

Achievement Scales in Household Science. Division I, Scale S. By MAY E. DAVIS. Boston: Ginn and Company, 1928, $.72.

Thirty copies of the scale prepared for use in grades 8 and 9, under the direction of Agnes Fay Morgan, professor of household science, and M. J. Van Wagenen, visiting lecturer in educational psychology and statistics, at the University of California; with directions and a duplicate class record blank. Includes material from the field of food values, preparation, and serving, with items of the alternate-choice, true-false, and completion types.

The Problem of Indian Administration. Report of a survey made at the request of Honorable Hubert Work, Secretary of the Interior, and submitted to him, February 21, 1928. Institute for Government Research Studies in Administration. By the Survey Staff, LEWIS MERIMAN, Technical Director Baltimore: The Johns Hopkins Press, 1928, pp. 872, $5.00.

A volume likely to prove of significance in the development of Indian administration under the federal government. From the numerous, scattered references to housing

and living conditions, family life, instruction in homemaking and health, and the possibilities of home demonstration work, a fair idea may be gained of the present status and future possibilities of home economics in the Indian Service. A detailed index adds to its value.

The Ways of Behaviorism. By JOHN B. WATSON. New York: Harper & Brothers 1928, pp. 144, $2.00.

An exposition, by one of its most widely known leaders, of "the scientific study of human behavior" which is now attracting much popular attention and which hopes in time to be able to predict human actions from systematized observation of man's reactions to the stimuli presented by his environment and also to develop in him desirable habits by scientifically controlling those stimuli. A readable volume, much of which appeared originally in *Harper's Magazine.*

Technical Writing of Farm and Home. By F. W. BECKMAN, HARRY R. O'BRIEN, and BLAIR CONVERSE. Ames, Iowa: Journalism Publishing Co., 1927, pp. 417, $2.50.

A handbook of "the technique of journalistic writing as it is applied to such subject matter as agriculture, home economics, engineering, and the sciences;" useful both to those who intend to follow journalism as a profession and to those who will find ability to write for papers or magazines a valuable adjunct to professional or civic work. Contains a chapter on writing on women's interests which should be generally helpful though especially adapted to the use of extension workers and writers for rural papers.

Publicity for Social Work. By MARY SWAIN ROUTZAHN and EVART G. ROUTZAHN. New York: Russell Sage Foundation, 1928, pp. 392, $3.00.

Practical information regarding ways and means of "making information public," brought together and systematically arranged by two well-known workers in the Department of Surveys and Exhibits of the Russell Sage Foundation. Includes suggestions not only for printed material of many kinds, from press items to posters, but for fairs, exhibits, and dramatic events, for the planning of meetings and the blocking out of intensive campaigns. Valuable for many others than social workers.

Provincial Society, 1690–1763. By JAMES TRUSLOW ADAMS. A History of American Life, Volume III. New York: The Macmillan Company, 1927, pp. 374, $4.00.

The Emergence of Modern America, 1865–1878. By ALLEN NEVINS. A History of American Life, Volume VIII. New York: The Macmillan Company, 1927, pp. 446, $4.00.

Two of the volumes in a series edited by Arthur M. Schlesinger and Dixon Ryan Fox the purpose of which is to present the development of American civilization and the interests of its citizens—the houses they lived in, the conditions under which they earned their living, the way they enjoyed themselves, and the things they talked and thought and read about. The text and the illustrations contain many items of interest to students of social manners and customs and help to fix the times and conditions which brought these into being.

ABSTRACTS FROM PERIODICALS

CHILD DEVELOPMENT AND PARENTAL EDUCATION

EDUCATIONAL METHODS

Goodenough, Florence L. The relation of the intelligence of preschool children to the occupation of their fathers. *Am. J. Psychol.* **40**, 284–294 (1928).

A study of the intelligence of 380 children equally distributed by number and sex among the ages of 2, 3, and 4 years, whose fathers' occupations were classified in six categories from professional to unskilled labor, with distribution almost identical for the three age groups. Each child was given the Kuhlman revision of the Binet tests twice, at an interval of six weeks. The mean IQ was found to decrease steadily down the scale of paternal occupation, from 125 for the professional group to 95.8 for the unskilled labor group. An exhaustive comparison is made of this with other studies, and the results graphically presented. The author concludes: "These data show that intellectual differences between social classes are well established by the ages of 2, 3, and 4 years. . . . . The findings have to do only with the present generation . . . . though . . . . it is not unreasonable to expect that with increasing specialization . . . . differentiation of occupational classes along educational lines will become even more marked. . . . . The fact that children of different social classes show as great differences in their performance of these extremely simple tasks [involved in the tests] as they afterward manifest in regard to the relatively complex problems of later life, lends support to the theory that under ordinary conditions of modern life, variations in mental growth are more directly dependent upon innate factors than upon differences in post-natal opportunity or stimulation."

Wiley, W. E. Difficult words and the beginner. *J. Educ. Research* **17**, 278–289 (1928).

An experimental study of the factors which condition the acquisition of a reading vocabulary by first-grade children leads the author to the conclusion: "The meaning which a word has for a first-grade child is a factor which will greatly influence the difficulty he may have in learning to recognize the word symbol and hence more attention should be given this factor in selecting vocabularies. Inclusion of a word in the spoken vocabulary of children, in children's literature, or in any of the present word lists does not seem to be an adequate measure of the learning difficulty of the word." An appended table lists the words given in the test and those with which they were confused.

De Sanctis, Sante. Intuitions of children. *Ped. Sem. J. Genetic Psychol.* **35**, 18–25 (1928).

Intuition is defined as an immediate act of cognition in contrast with analytical and discursive cognition. Children are shown to have this rather unanalytical intuitive logic. Results are presented and discussed of recent experiments on the accuracy of judgments of form, distance, quantity, mass, extension and others as shown by young normal children, feebleminded children, and normal and deficient adults. The author believes these results "justify the conclusion that there is an antithesis between the rational cognition or general intelligence and intuitive cognition; and that the latter is not only more rapid but also more accurate in children than in the individual who possesses the complete development of the common logical thought." He holds further that if further experiments confirm these results, methods for teaching the feebleminded must be revised.

Foster, Josephine C. Verbal memory in the preschool child. *Ped. Sem. J. Genetic Psychol.* **35**, 26–44 (1928).

A study of learning and reproduction of sensible prose material by very young children with a detailed discussion of the data and 5 plates and 5 tables. Ten carefully selected stories were told to 31 children

from 2 years 7 months to 4 years 9 months of age, and with an average IQ of 119.6, at regular intervals until 10 presentations were given, with regular pauses to give the children opportunity to complete the story. The material used proved satisfactory; the learning curves obtained from nine reproductions of the stories used approximated the linear and showed no tendency to become flattened; children of higher chronological ages showed definitely greater ability in reproducing stories; those with higher mental ages reproduced a greater amount of material than those with lower mental ages; sex differentiation was in favor of the boys; crowding five repetitions into one day was not economical for learning; no significant differences appeared when stories were alternated; relearning of old stories was hindered when other stories were introduced in the interval; the particular hesitations which were filled in depended little on familiarity of the words but considerably on the closeness with which the sense of the passage was knit. The children who gave the most correct responses also gave the most erroneous replies.

Heinlein, Christian Paul. A brief discussion of the nature and function of melodic configuration in tonal memory, with critical reference to the Seashore tonal memory test. *Ped. Sem. J. Genetic Psychol.* **35**, 45–61 (1928).

An exhaustive consideration of the Seashore tonal memory test leads the author to the conclusions that it consists of more than five degrees of difficulty for judgment, that the method of grading it is inadequate, and that tonal memory of the identification type has little value in the diagnosis of musical talent.

Lehman, Harvey C. The child's attitude toward the dog versus the cat. *Ped. Sem. J. Genetic Psychol.* **35**, 62–72 (1928).

In a study of the voluntary play activities of a large group of unselected children, both boys and girls indicated that they played more frequently with dogs than with cats. The author analyzes this preference and shows that it results from the hereditary gregariousness of the dog and solitary habit of the cat. The gregariousness of the dog makes him more companionable and "human" than the cat, hence a more desirable playmate.

Wagoner, Lovisa C. and Armstrong, Edna M. The motor control of children as involved in the dressing process. *Ped. Sem. J. Genetic Psychol.* **35**, 84–97 (1928).

A report of studies to determine the motor control involved in dressing and to find some means to measure the maturity necessary before a child is ready to dress himself, involving 30 nursery school children from 1.75 to 5.08 years of age. The Stanford revision of the Binet, Merrill-Palmer performance, and Goodenough drawing tests, some measurements of span, several situations in which buttoning was performed, and general observations were the criteria. The correlations show that tests measuring performance rather than intelligence are related to ability to manipulate buttons and buttonholes, and that this ability results from increasing maturity as well as learning. Loops seemed to be more satisfactory than buttonholes on children's clothing. Personality differences in the children are clearly shown. Further studies are felt to be desirable, to determine both a criterion of "dressing readiness" and the type of fastening most readily handled.

Cowan, Edwina Abbott. Results of motor reconditioning methods used in training a backward child. *Ped. Sem. J. Genetic Psychol.* **35**, 98–104 (1928).

An interesting case study of the successful training of a backward child. The latter had suffered a severe illness during her first two years which prevented the development of "certain capacities believed to be results normally involving kinesthesia in early infancy, namely, muscular coördination, inhibition (control), space perception, and (possibly) self confidence." The automatizations which normally result from random muscular activity in infancy were taught her by artificial emphasis on muscular activity, much of which was done with the child blindfolded. Close correlation was observed be-

tween the stages of mental development during this period of artificially stimulated motor coördination and the completion of a new muscular automatization, the latter always anteceding slightly a definite advance in mental development.

Stroud, J. B. A study of the relation of intelligence test scores of public school children to the economic status of their parents. *Ped. Sem. J. Genetic Psychol.* **35,** 105–111 (1928).

This study was made in a southern rural community of native-born whites, and involved a correlation of the test scores of 1057 public school children between 5 and 18 years of age with the tax assessments of their parents. The related variables were intercorrelated. A low positive correlation is found between intelligence test scores and economic status, which is considered reasonably significant since the population is homogeneous. When the effect of the number of children tested per family and the age of the parents was held constant, the correlation coefficient was slightly raised. Incidentally, a negative relationship was indicated between the number of children in a family and its intellectual status.

The Three R's. *Progressive Educ.* **5,** No. 2, 99–192 (1928).

A survey of present progressive methods in teaching these fundamentals. Pertinent articles include: Laura Zirbes, Progressive practice in reading, 99–103; Marjorie Wise, Manuscript writing, 108–110; Ernest Horn, Teaching spelling in the elementary school, 114–117; Sterling A. Leonard, Old and new in elementary composition teaching, 118–124; Margaretta Voorhees, New methods in arithmetic, 124–130; and a symposium upon the use of tests and measurements in the Three R's, 136–152.

Goodenough, Florence L. Studies in the psychology of children's drawings. *Psychol. Bull.* **25,** 272–283 (1928).

A comprehensive review of the interest taken by psychologists in children's drawings as shown in the literature, especially that appearing from 1915 to the present. A bibliography of 110 titles is given.

Kwalwasser, Jacob. Tests and measurements in music. *Psychol. Bull.* **25,** 284–301 (1928).

A classification of representative tests of musical capacity and of musical achievement. The former are divided into (a) sensory tests, including those of Seashore for pitch, intensity, time, consonance, tonal memory, and rhythmic discrimination, and of Schoen for relative pitch and rhythms; (b) feeling tests, including Kwalwasser's for melodic and for harmonic sensitivity, and Schoen's for tonal sequence; (c) motor tests for motility and for reaction time. It is shown that since these are tests of innate capacity, no correlations are expected or found with sex, age, training or intelligence, nor with one another. No difference in musical capacity is found between boys and girls, nor does it increase with age or with training. Reports of the relationship between aptitude scores and subsequent performance are conflicting, but here as elsewhere other factors than native capacity influence success. A study of white and colored fifth grade children showed the latter to be far superior in rhythm and tonal memory. Tests of achievement are divided into those measuring: (a) knowledge, the largest number devised for this group, for musical notation, theory, ear training and auditory imagery; (b) appreciation, the aesthetic response to music; (c) performance, with but two, for individual sight singing skill. The author feels that testing in music has made progress and reveals "information that is most significant for music education."

HABIT FORMATION AND BEHAVIOR PROBLEMS

Riddle, E. M. Stealing as a form of aggessive behavior. Parts 2 and 3. *J. Abnormal Soc. Psychol.* **22,** 157–169 (1927), and **23,** 79–93 (1928).

Continuations of a series of papers of which Part 1 was noted in J. Home Econ. **20,** 512 (1928). In Part 2 all forms of steal-

ing as reported in the case histories of children studied at a child guidance clinic were analyzed and then classified in accordance with the apparent degree of aggressiveness required to carry them out. The median chronological age of the children involved is found to increase in proportion to the amount of aggressiveness required, from 13 years 1 month for stealing in the home to 17 years 8 months for forgery. The same relation is found between the degree of mental maturity of the child and the amount of planning and forethought required by the theft. Forms of theft and degrees of intelligence fall into well-defined groups; stealing from home and stores, taking bicycles in the streets, burglarizing, and committing highway robbery are done by children with IQs from 72 to 79; children who rob freight cars and slot machines have IQs of 50 to 60; while those who commit forgery are of normal intelligence.

Part 3 deals with the conditions affecting children who steal. It is shown that a certain amount of mental maturity must have been reached before stealing is attempted, though stealing from home and stores occurs at a mental age of 3, and forgery at that of 12. Among the children in question the lowest IQ was 25, the highest 124, and the mean was 78. Sixty per cent showed but one form of stealing, and but 1.3 thefts per child. Among those using more than one type 2.6 thefts were committed per child. No unusual type of desire was found in children who steal, the difference between them and others being probably in the strength of desire or the degree of control exerted. Stealing is found to be closely assocated with lying and to a less degree with such aggressive behavior as fighting, truancy, and running away. The only particular character trait suggested was a more pronounced degree of aggressiveness.

Carmichael, A. Max. To what objective stimuli do six-year-old children respond with intentional misrepresentation of facts? *Ped. Sem. J. Genetic Psychol.* **35,** 73–83 (1928).

From 1200 written descriptions of situations to which six-year-old children responded with a good or bad act, in which over 300 responses were recorded, 289 representing responses of 119 children were classified as intentional misrepresentation of facts, and these form the basis for this study. These data are examined, and the results, presented in five tables, are comprehensively discussed in an attempt to determine what the objective elements are in situations to which six-year-old children intentionally misrepresent facts, and how they combine. "The elements appearing in 97.2 per cent of the situations are (1) the child had committed an irregular or non-conforming act and was called upon to account for the act, (2) he wanted to obtain, keep, or care for property, (3) he was competing with another, (4) he was being forced by another into performing some act, and (5) his activity was being frustrated by another." The second of these occurred alone in 61.6 per cent of the situations. There are 239 appearances of the total 14 elements considered in the other 111 situations, an average of 2.16 appearances per situation. The 14 elements appear 417 times in the 289 situations, an average of 1.44 appearances per situation. Many interesting questions for further investigation are raised by the study.

H. R. H.

FOOD AND NUTRITION

Jones, D. B., Nelson, E. M., and Murphy, J. C. Biological values of certain types of sea foods. III. Vitamins in clams. *Ind. Eng. Chem.* **20,** 648–652 (1928).

Continuing the series of studies of seafoods (See J. HOME ECON. **20,** 367, 1928) the authors report that hard-shell and soft-shell clams contain little if any of the vitamin B complex, are somewhat lower in their vitamin A content than oysters, but are richer in vitamin D and in "the factor or factors essential for reproduction and rearing of the young." The only difference noted between the two varieties was in the vitamin A content which was somewhat higher in the soft-shell than in the hard-shell variety. Two grams daily of the former proved sufficient for the cure or prevention of xerophthalmia in rats and the same amount of either variety sufficed for complete calcification in 15 days in the D tests.

Hunt, C. H. The complex nature of vitamin B as found in wheat and corn. *J. Biol. Chem.* **78,** 83–90 (1928).

The conclusions of Sherman and Axtmayer that whole wheat is richer in vitamin F than in vitamin G (See J. HOME ECON. **20,** 214, 1928) have been confirmed and it has also been shown that corn contains the same relative proportions of F and G as wheat. In the presence of sufficient vitamin G, supplied in the present study by yeast autoclaved for 4 hours at 15 pounds pressure, 15 per cent of either wheat or corn furnished about the minimum of vitamin F for growth.

Outhouse, J., Macy, I. C., and Brekke, V. Human milk studies. V. A quantitative comparison of the antiricketic factor in human milk and cow's milk. *J. Biol. Chem.* **78,** 129–144 (1928).

The authors have extended their comparison of the vitamin content of human milk and cow's milk (See J. HOME ECON. **19,** 468, 1927) to determinations of vitamin D by a technique differing from the methods commonly employed in that the salt composition of the basal diet was altered with each experiment to make the proportion of Ca to P always fall between the ratios of 5:1 or 4:1. The diagnosis of rickets was confirmed by three different methods—histological, line test, and x-ray examination—with additional evidence in the percentages of calcium, phosphorus, and ash of the bones. It is thought that these chemical analyses are of great value in determining the degree of calcification of bones but should not be relied upon alone for the diagnosis of rickets in rats.

The human milk was obtained from the same sources as in the previous studies, i.e. from wet nurses who had not been taking cod liver oil, and the cow's milk was certified milk from a large herd. The human milk contained as an average 30 mg. of calcium and 14 mg. of phosphorus, per 100 cc., and the cow's milk 100 and 97 mg. respectively. These differences were compensated by altering the proportion of the two elements in the basal diet. Under these carefully controlled conditions the human milk had no antirachitic effect when fed to rats in amounts of 25, 30, or 40 cc. daily while the cow's milk in daily doses of 30 cc. induced marked healing of rickets in seven days.

Peterson, W. H. and Elvehjem, C. A. The iron content of plant and animal foods. *J. Biol. Chem.* **78,** 215–223 (1928).

This is an extension of the data previously reported (See J. HOME ECON. **17,** 265–280, 1925) to about 150 samples of common food materials chiefly of plant origin but including figures for a number of samples of fish and poultry. The figures range from 0.00015 per cent (calculated on the basis of undried material) for lemon juice to 0.0192 per cent for parsley. The different classes of materials arranged according to decreasing iron content were dried legumes, green leafy vegetables, dried fruits, nuts, cereals, poultry, green legumes, roots and tubers, non-leafy vegetables, fish and fruits. As was true in a similar study of manganese (See

J. HOME ECON. **20**, 194–200, 1928) different samples of the same food material showed wide variations in their iron content. The minimum and maximum figures obtained for twenty samples of cabbage were 0.00017 and 0.00059 per cent. Vegetables containing very little chlorophyll such as cabbage, celery, and head lettuce were low in iron.

Orange juice and tomato juice contained less iron with reference to total content than was proportional to the weight of the expressed juice. For this reason it is suggested that infants should be fed both juice and pulp of these materials as early as possible.

Salt water fish contained about 40 per cent more iron than the fresh water species. The dark tissues of fish and of poultry contained more iron than the corresponding light tissues.

Mackay, H. M. M. Treatment of rickets. I, II. *Lancet*, 1928, I. 923, 924, 979, 980 (1928).

These papers, which form a part of a series of articles on Modern Technique in Treatment, contain practical directions for the diagnosis of rickets and general and specific measures for its prophylaxis and cure. Specific prophylactic measures such as ultraviolet irradiation or administration of cod liver oil are recommended for "all artificially fed infants throughout the winter and throughout the year if sufficient outdoor life cannot be insured; breast-fed infants who are little out of doors; all premature infants throughout the year; all infants of dark-skinned races living in this country (England) throughout the year."

Cod liver oil is thought to be a much safer source of vitamin D at present than concentrated extracts or irradiated ergosterol chiefly on account of lack of knowledge concerning the keeping qualities of various concentrates and the possible danger of overdosage with irradiated ergosterol. It is noted in this connection that curative doses of irradiated ergosterol have been recommended which are apparently equivalent in vitamin D content to nearly half a liter of cod liver oil daily.

Coward, K. H. A method of assay of the antirachitic vitamin D. *Quart. J. Pharm.* **1**, 27–38 (1928).

The technique which has been adopted at the Pharmacological Laboratory, Pharmaceutical Society of Great Britain, for the quantitative determination of vitamin D is described in considerable detail. The procedure is essentially that of Steenbock and Black based upon the McCollum line test, but for purposes of standardization controls are run with a standardized preparation of irradiated ergosterol. By equating the curative dosage of the material being tested with the corresponding dosage of irradiated ergosterol it is possible to calculate the amount equivalent to the dose of 0.0001 mg. of irradiated ergosterol which has been adopted as the standard. The amount may then be expressed as the number of units of antirachitic potency contained in a convenient measure of the substance tested.

S. L. S.

HOUSEHOLD EQUIPMENT AND MANAGEMENT

ELECTRIC POWER

Cooke, Morris Llewellyn. What price electricity for our homes? Obtainable from the author, 1520 Locust Street Philadelphia, Pa., 49 pp. 1928.

An open letter addressed to the electrical industry by an engineer whose wide experience in studying electrical rates has convinced him that the discriminationn made against the domestic consumer by the electrical industry should now be removed and that domestic rates should be fixed on a basis of cost plus a fair profit. He maintains that this would result in greatly increased consumption of current and in great labor-saving and improved conditions in the home, without lowering the net revenue to the electrical industry. The basis of current domestic rates is discussed, together with the origin of the present rate systems, the vanishing importance of load factor and peak load, the factors to consider in fixing rates, the cost of generating and distributing electricity, examples of residential service at lowered rates, the effect of such rates on company revenues, the timeliness of rate adjustment, and the social value of low residential rates.

Daugherty, C. R., Horton, A. H., and Davenport, R. W. Power capacity and production in the United States. Department of the Interior, U. S. Geological Survey, Water-Supply Paper 579, 1928.

A statistical study of the growing use of power in this country from 1849 to 1923, as indicated by the horsepower capacity of equipment installed in industry, agriculture, and transportation. The increase in power is compared with the growth of population and output per worker. The volume also contains statistics of production of electricity by public utilities.

Wyer, Samuel S. Analysis of electric service for rural homes. Hartman Building, Columbus, Ohio. 1928, pp. 8.

Reprint of a discussion, first published in 1924, concerning the desirability of electric power for rural homes, and the economic limitations of high tension lines for rural service, with the conclusion that it is of national importance to improve the labor-saving standards of the rural home; that electric service for them is desirable; but that questions arise as to how the rural consumer can meet the installation costs of electric equipment and the operating costs of the service, and whether it is better to extend high tension wires or generate electric current on the farm. Electric heating of farm homes is impractical, its cost for cooking is higher than that of other fuels, and "a reduced rate for cooking as compared to other domestic service, except for quantity use, is not justified in social justice and nondiscrimination to all customers. . . . . A large percentage of rural homes . . . . for many years . . . . cannot enjoy the benefits of electric service from high tension transmission lines fed from remote power stations."

Wyer, Samuel S. Fundamentals of electric service for our homes. Fuel, Power, Transportation Educational Foundation, 1014 Hartman Building, Columbus, Ohio. 1928, pp. 16.

An analysis of the factors which determine the cost of electricity to the domestic consumer, written for the layman and leading to the conclusion that the "domestic consumer's service costs more, not because he is a consumer living in a home, nor merely because he is a small quantity consumer, but because he is a short hour user."

GENERAL EQUIPMENT

Eiseman, J. H. Cautions regarding gas appliance attachments. *Am. Gas J.* 128, Apr., 32–36 (1928).

A discussion of appliances tested by the U. S. Bureau of Standards, some of which have failed to fulfill the claims made for them but are harmless, others which produce dangerous conditions. Four "gas savers" for use on gas burners produce carbon monoxide at each of three common gas rates tested, without effecting the gas saving

claimed; attachable solid tops designed to replace grids of open top ranges show disadvantages in use for outweighing the few advantages, besides a definite hazard from carbon monoxide, and no fuel saving; "grease absorbers" for the flue collar of the gas range tended to interfere with the complete consumption of gas in the oven, increasing the hazard, and diffused rather than removed the grease: "burner protectors" prevented clogging of burners at the expense of speed of cooking; "water backs," designed to utilize the waste heat of range burners to heat water which circulated around or over them to a storage tank, may or may not affect gas combustion but do reduce burner efficiency and speed of cooking. In appliances built to perform several functions "with the same heat" it is pointed out that "while the total thermal efficiency of the combination under the most favorable conditions may be greater than when separate burners are used for each purpose, it rarely happens that the user will want to employ all the facilities of the stove at the same time in the fixed rates which will give the highest efficiency" and that unless so used, the combination appliances are very inefficient and relatively costly.

Grunsky, Clotilde. No hazardous appliances are sold in Portland, Oregon. *Elec. Merchandising* **39,** June, 106–109 (1928).

Only appliances and accessories which conform to the standards of the underwriter's laboratories or to the specifications and requirements of the U. S. Bureau of Standards may be sold in Portland under a city ordinance which provides a license for electrical dealers, and for inspection of stocks, thus guarding against fires and other accidents. A copy of the ordinance and an account of enforcement methods are given.

Adequate electrical service makes a home servantless. *Elec. Record.* **43,** 705–708 (1928).

Brief notes, with photographs, explain the features of this six-room house which has a high level of illuminating intensity and well placed convenience outlets, some of which are at waist height or a little above. The laundry and heating compartments are on the first floor, the latter, heated with a gas furnace, is equipped with fans to circulate warm air to every room. The same system will circulate out-door air through the house in summer.

The ideal home exhibition at Olympia. *Housecraft* (London) **1,** 96–99 (1928).

An interesting account of the special features of the annual home exhibition held recently in London. A full-sized model "house of the future" made daring predictions with its equipment to utilize electricity, rubber, wireless sending and receiving sets, television, ultra-violet ray lighting, even a family "areocar" to be driven on land, air, or water. Less spectacular but interesting were the other "sun beam" houses, the exhibit of food products produced within the Empire, new electrical devices, handicrafts of all kinds, and beautiful gardens.

Home Equipment Primer. Part 5. Equipment for homes within reach of the four principle home serving utilities—water works, sewer system, electric light and power service, and gas works. General Federation of Women's Clubs, pp. 50.

A booklet describing "a modern conservation kitchen which conserves food, fuel, time, and youth of the housekeeper through its arrangement and equipment," together with notes and pictures of various types of labor-saving household equipment and tables of initial costs and costs of operation.

HEATING

Electric water heaters. *Domestic Eng.* **123,** May 26, 18–20 (1928).

Pertinent questions in regard to heating the domestic water supply by electricity are answered, with many illustrations of this type of equipment.

Moffatt, L. E. Getting the facts. *Elec. Merchandising* **39,** May, 72–75 (1928).

A discussion of the fire and personal safety hazard resulting from sub-standard electrical heating appliances and the tests used to detect them.

Day, V. S. Relative consumption of various solid fuels in residence heating. *J. Am. Soc. Heating Ventilating Eng.* **34,** 461–465 (1928).

From the results of tests conducted in heating a "research residence" the author compares the relative economy of six distinct classes of solid fuels and gives a method of approximating the consumption of any other solid fuel of known physical and chemical characteristics. Tables are given of the proximate analysis of the six fuels, anthracite, by-product coke, Pocahontas, and three softer grades of bituminous coal; an analysis of fuel consumption and relative economy of the fuels used; and a graph shows the consumption of various types of fuel in the test plant and the relation of heat value, volatile oil, and ash. Pocahontas coal appears to possess the "greatest number of economical characteristics, least tonnage, least ash-handling, and least cost. Soft coal, having the lowest unit price, was not the cheapest coal for the season and required the greatest tonnage. This fuel, though unsatisfactory from the standpoint of smoke, soot, ashes, and low thermal efficiency, has one advantage, quick ignition, and acceleration of the fire, which makes it adaptable to intermittent firing."

Stark, W. E. Development of gas heating for homes. *J. Am. Soc. Heating Ventilating Eng.* **34,** 467–475 (1928).

Gas as a heating fuel is a developing field. Natural gas has been used sometime for heating dwellings in sections where it has been abundant and cheap, chiefly in conversion burners with little regard to their efficiency. Boilers and warm air furnaces, with high efficiency, have been designed for use with gas, and where a lower rate is granted for heating a load may be developed satisfactorily among home owners of higher economic levels. While the installation and fuel cost is somewhat higher it has the advantages of low maintenance and labor cost, no fuel storage, freedom from smoke dust and ashes, and superior automatic temperature control. Its extensive acceptance for heating buildings depends upon (1) economic pressure due to rising costs of fuels now inefficiently utilized; (2) development of cheaper gas-making processes; (3) development of uses for by-products of those processes; (4) increasing demands for pure air.

LAUNDERING

Summary of estimates of the hygienic performance of laundries. Boston University, Bureau of Consumer Research, 1927.

Summary of the 363 returns received from a questionnaire sent health officers in cities over 10,000 to determine "(1) Whether any recent cases of contageous or infectious diseases had been directly traceable to laundries; (2) whether the city ordinances include a sanitary code for laundries, and if it is complied with; (3) whether the average hygienic performance of laundries is estimated to be sufficiently high to safeguard the householder as well as, or better than, any other method of handling the family linen problem." All the returns report no cases of disease traceable to the laundry during the past two years, while 98.6 per cent report no cases over a period from 3 to 20 years previous to 1925. All claimed compliance to ordinance where such existed, though 70.79 per cent reported no ordinance existing. In 80 per cent of the answers the opinion was expressed that the laundry is as safe or safer than other methods; 9 per cent believe other methods better; 7 per cent feel they have no data by which to judge.

REFRIGERATION

Gas-operated refrigerator car is success. *Am. Gas Assocn. Monthly* **10,** 285–286 (1928).

A description of the refrigerator car and unit recently perfected in which the silica gel process of refrigeration is used, (see next abstract), the heat from a stored and automatically controlled gas supply providing the heat to dry the refrigerant vapor from the silica gel.

The silica gel refrigerating system. *Cold Storage* [London] **31,** 109–110 (1928).

An explanation of the principle upon which silica gel may be used as a refrigerant. Silica gel, a hard, glassy, inert material, is extremely porous and is capable of ab-

sorbing large quantities of vapors by a purely physical action. The absorbed vapors may be driven out by heat, and the capacity to absorb restored. This cycle may be repeated indefinitely with no alternation in the structure of the silica gel or decrease in its absorptive powers. The apparatus consists of an absorber containing the silica gel, an evaporator, and a condenser. The silica gel is activated by heat directly applied, after which it absorbs vapor from the refrigerant in the evaporator, thus causing a lowering of temperature. When the silica gel is saturated it is heated again and the vapor is driven out, passed into the condenser, liquefied, and returned to the evaporator. In operation the heating period is much shorter than the absorption period and by an alternating system continuous refrigeration is produced. Efficient utilization of the principle in refrigerating cars has been demonstrated and an automatic temperature control has maintained any desired temperature over a fixed period.

Timmerman, W. M. and Whitesel, H. A. Testing domestic refrigerators. *Refrigerating Eng.* **15,** 151–154 (1928).

The description of the testing procedure for the electric refrigeration unit, the insulated cabinet, and the completed product applied in a manufacturer's laboratories, to check uniformity and efficiency in his output.

VENTILATION

Duffield, Thomas J. How much fresh air does the school child need? *J. Am. Med. Assocn.* **90,** 1276–1278 (1928).

Charts are presented to show (1) the number of cubic feet of outdoor air at each degree between 0° and 60°F. which is raised to indoor temperatures between 65° and 70° by one B. T. U., and (2) the total heat output per hour of children at each age between 7 and 16 years. From this it is shown that the common practice of designing mechanical ventilation systems to furnish 30 cubic feet of air per child per minute is unnecessary and wasteful. Provision should be made for a heating plant to compensate for the structural heat losses over a wide range of outdoor temperatures, and to introduce quantities of air varying with the average ages of pupils and the outdoor temperatures, without drafts.

Lewis, S. R. Practical ventilation for schoolrooms. *J. Am. Soc. Heating Ventilating Eng.* **34,** 315–325 (1928).

A comprehensive, illustrated discussion of the means by which the recommendations of the New York Commission on Ventilation, favoring window ventilation with ample direct radiation, window deflectors, and adequate gravity exhaust wherever possible, may be adapted for use in the small rural school, the school of 4 to 12 rooms, and the large school. The author feels, however, that if mechanical ventilation can be shown to produce equally desirable health results, it is the most reasonable and logical type for ordinary conditions.

Duffield, Thomas J. Effects of mechanical and natural ventilation on the health of school children. *J. Am. Soc. Heating Ventilating Eng.* **34,** 327–347 (1928).

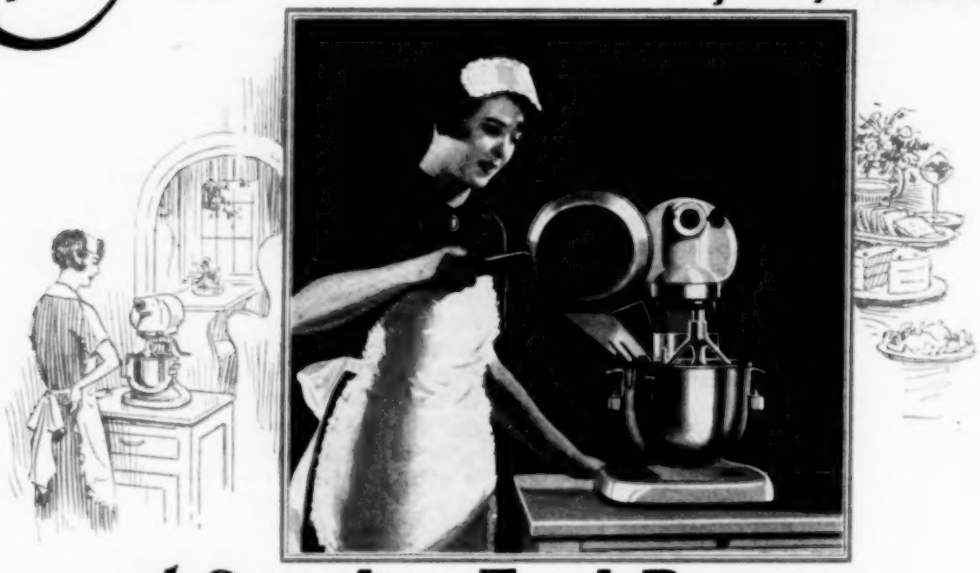
The pupils in three modern, mechanically ventilated and three old, naturally ventilated school buildings in Syracuse, New York, were studied during the winter of 1926–27 to determine whether there was any relationship between the incidence of respiratory disease, and the type of school ventilation. Many data are presented and analysed, and while possible errors such as differences in diagnosis of respiratory diseases, possible falsification of cause of absence, and limited number of subjects make unqualified conclusions impossible, it appears that "natural ventilation has some inherent virtue which mechanical ventilation does not possess, or that mechanical ventilation involves some harmful influence from which natural ventilation is free." Further studies will attempt to determine whether the high rate of air change is, as is somewhat indicated, "the causative agency in the excess of respiratory illness absenteeism in the mechanically ventilated schools."

H. R. H.

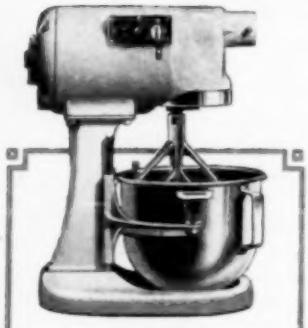
The New KitchenAid

REG. U.S. PAT. OFF.

Electrical Food Preparer for the Home



A Complete Food Preparer *in a* Single Electric Unit ~



The new KitchenAid weighs only 38½ lbs; is 18 inches high. Fits anywhere, and attaches to any light socket. Simplicity itself. A child can operate it. Costs less than 1c per hour for current.

Made by the KitchenAid Manufacturing Company, a subsidiary of the Hobart Manufacturing Company, which for more than a quarter of a century has been engaged in the manufacture and sale of Electric Food Preparing Machines.

KitchenAid is today's way of sanitary food preparation. It guarantees better food; food of greater variety; food quickly, easily and economically prepared. It takes over the hardest tasks in cooking and baking—with amazing results!

Snap the switch and this Electric Maid will lend you the equivalent of five pairs of hands! It *mixes* dough and batter for breads and cakes, biscuits, waffles, pies; it *whips* cream, *beats* eggs. It *grinds* coffee and wheat for cereals. It *chops* meats; *makes* apple-sauce without paring or coring. It *slices* vegetables and firm fruits; *mashes* potatoes (with amazing improvement in whiteness and fluffiness); *strains* soups; *sieves* butters and jellies; *mixes* mayonnaise; *extracts* fruit juices; *freezes* ice cream, no hand cranking; and does 101 other things that take time and energy.

Over 15,000 KitchenAids in use today. Endorsed by Good Housekeeping, Delineator and a score of other Institutes. Used in the Domestic Science Departments of leading schools and colleges. Employed daily in commercial Test Kitchens, Laboratories, and Diet Kitchens. Recognized as essential, standard equipment in the modernly appointed kitchen.

We shall be glad to send you the complete story of this remarkable electric helper without obligating you in any way if you will fill out and mail the coupon below. Do it now while this page is before you.

"Will you accept ....
this 40 Page Illustrated Booklet

The KitchenAid Manufacturing Company
Dept. JE-98 Troy, Ohio

Please send me complete information on KitchenAid together with reports from Home Economics leaders.

Name.....

Position.....

Street.....

City.....

State.....

MISCELLANY

Infantile Paralysis. A press release from the United States Children's Bureau reports a gift of $250,000 by Jeremiah Milbank for a three-year international study of infantile paralysis which will be participated in by Chicago, Columbia, Harvard, and New York Universities, the University of Brussels, the Lister Institute of London, the Metropolitan Life Insurance Company, and perhaps by other institutions here and abroad. The head of the department under which the work is done in each institution is included on the committee in charge.

Hannah Sawbridge, Seventeenth Century Publisher. According to Dr. C. F. Langworthy of the U. S. Department of Agriculture, the publishing business is not a new one for women and one of the early women in this field included domestic subjects on her lists. An edition of Gervase Markham's "The English Housewife," one of the most popular books of its day, speaks of it as "a work generally approved, and now the Ninth time much augmented, purged and made most profitable and necessary for all men and the general good of the *Nation*," and says that it was "printed for Hannah Sawbridge at the Sign of the Bible on Ludgate Hill, 1683." Another volume bearing the same imprint is Markham's "Weald of Kent," a book dealing with agricultural problems.

Motion Pictures in the Schools. The use of motion pictures by schools in 12 large cities proved so successful in an experiment conducted by the Eastman Kodak Company that an ambitious program for developing motion pictures to be used for instruction in educational institutions of all grades is now under way. The experiments in the use of motion pictures engaged approximately 176 teachers and 12,000 pupils. Six thousand of the children received a ten-weeks course of study with the use of the films and 6,000 children received instruction covering the same subject matter without the use of the films. Tests given under the supervision of Dr. Ben D. Wood of Columbia University and Dr. Frank N. Freeman of the University of Chicago proved convincing as to the value of the motion pictures, and the teachers are reported as overwhelmingly in favor of their use.

New York University, College of Fine Arts. A separate college devoted to the fine arts is to be added to the degree-conferring schools at New York University. According to *School and Society*, industrial arts will be included and arrangements will be made for students to work in European art centres.

Professional Training. Newer ideas for training in the various professional fields are brought together by specialists in the *Survey Graphic* for June. The section on home economics is by Louise Stanley, chief of the United States Bureau of Home Economics.

Social Science Research Council. In its annual report for 1926–27 the Council announces plans for "A Study of the Methods and Results of the Cincinnati Court of Domestic Relations and Juvenile Court." The study will be directed by Dr. William Healy and the funds administered by the Judge Baker Foundation of Boston.

The Nurse and the Quack. Under this title Stuart Chase and Dr. Edith Ayers Copeland, in the *American Journal of Nursing* for June, expose some of the nostrums and quackery with which nurses are likely to come in contact and emphasize the importance of educating consumers to protect themselves.

Consumer Ignorance and Food Costs. What a practical groceryman thinks of the way in which food products pass from producer to consumer and the customers allow their ignorance to prevent their getting their money's worth in the foods they buy, is told by D. W. Hardesty in the *National Grocers Bulletin* for June.

4 BAKING LEAFLETS

reprints from the new Royal Cook Book--

"ANY ONE CAN BAKE"

1. ***Rolls and Buns from Biscuit Dough:*** Explicit directions for making Finger Rolls, Clover Leaf Rolls, Parker House Rolls and Cinnamon Buns, including 12 motion picture photographs showing the important steps in making these quick rolls. Also, Table of Measures and Equivalents, and "master" recipe for Baking Powder Biscuits with eight delicious variations.

2. ***Quick Loaf Breads:*** Showing how to make Graham Bread, Peanut Butter Bread, Nut and Raisin Bread, with 12 motion picture photographs. Also discusses types of ingredients for various kinds of baking.

3. ***Cake Making:*** The Creaming Method carefully analyzed and illustrated with 12 motion picture photographs. Also recipes for 12 delicious cakes.

4. ***Angel Cake and Gold Cake:*** 12 photographs illustrating the making of 8-egg Angel Cake, 3-egg Angel Cake, and Gold Cake. Discusses methods, utensils and devices for cake decoration including icing recipes. Also shows the proper way to cut a home-made paper tube for decorating cake.

Free Leaflets

for distribution—any quantity you like! These are reprints from the new Royal book "Any One Can Bake." Indicate on the coupon how many of each you wish.

If you are interested in receiving an announcement of how a cheaper edition of "Any One Can Bake" can be had for the use of your students, be sure to include this information when you fill out and return the coupon.

Royal, the Cream of Tartar Baking Powder. Absolutely pure.

THE ROYAL BAKING POWDER CO.,
Dept. I., 100 E. 42nd St., New York City

Please send me free leaflets as indicated here:

... of Leaflet No. 1 ... of Leaflet No. 2
... of Leaflet No. 3 ... of Leaflet No. 4

Name_____

Name of School _____ Grade_____

Address_____

City_____ State_____

The Place of Science in Education. The American Association for the Advancement of Science has published the report of its committee on this subject, which includes the following recommendations: that some agency of national scope be asked to make a comprehensive and intensive study of the place of science instruction in educational systems; that a field secretary be secured; and that a council of science teachers be established to further the interests of the subject. A full copy of the report may be obtained from Elliott R. Downing, School of Education, University of Chicago.

Motion Pictures on Thrift. The National Thrift Committee requests that organizations or individuals who have films illustrating any phase of thrift report the same to the Motion Picture Bureau of the Y. M. C. A., which furnishes programs to many organizations and thus offers an unusual outlet for non-theatrical films. The director of the bureau is Mr. George J. Zehring, 120 West 41st Street, New York City.

International Thrift Day Congress and Institute. The International Thrift Institute at Milan, Italy, announces that the fourth celebration of International Thrift Day will be observed on October 31, 1928, and also that the second International Thrift Congress will be held in London October 7 to 12, 1928. The first Congress closed on October 31, 1924, and that day was chosen for world-wide attention to the subject of thrift. The International Thrift Institute, which is mainly an organization of savings banks, also resulted from that Congress. It recognizes the possibilities of thrift education through schools, the press, and such devices as posters and circulars; and a recent issue of its monthly *Bulletin* gives practical suggestions for such work. The *Bulletin* regularly notes the important books and articles on thrift as they appear in various countries.

Thrift Folder. Announcement is made that in connection with preparations for the 1929 National Thrift Week a folder has been issued, "Money—the Most Interesting and Dangerous Thing in the World," containing articles by two prominent educators on the training of children and the wise use of money. It will be sent on receipt of a two-cent stamp to cover postage, by the National Thrift Committee, 347 Madison Avenue, New York City.

What Constitutes Publication? Under this heading Dr. C. W. Stiles discusses the question of when publication is or is not publication, in *Science* for May 11, 1928. Although intended specially for zoologists, the article is worth noting by all concerned with the publication of scientific reports.

Association of Land-Grant Colleges and Universities. The Proceedings of the forty-first annual convention of the Association, held at Chicago, November 15 to 17, 1927, contain papers, discussions, and reports printed in full, including those from the section on home economics. The latter give the details of the interesting symposium on present-day problems of home economics reported editorially in the January JOURNAL.

Accredited Higher Institutions. A compilation of the standards for accrediting institutions of higher learning employed by the several national and regional associations and of the lists of institutions accredited or classified by each association has been published by the United States Department of the Interior, Bureau of Education, as Bulletin, 1927, No. 41. Standards for special training schools adopted by various professions and their accredited institutions are not given, but the organizations responsible for such work are included, together with the address at which information may be obtained.

Lamb as You Like It. Leaflets No. 28, the most recent of the attractively printed and illustrated popular circulars prepared in the United States Bureau of Home Economics, is by Lucy M. Alexander and Fanny Walker Yeatman and tells how to select, cook, and serve various cuts of lamb. The

suggestions are clear and simple, but are all based on extensive and careful experimental work, so that the leaflet is both useable and reliable. Copies may be obtained free on request to the United States Department of Agriculture, Washington, D. C.

University Women and Jobs. Two articles in the June number of the *Journal of the American Association of University Women* deal with this much-discussed subject. One is an essay entitled "From Pram to Office" by Endora Ramsay Richardson, and the other Mrs. Woodhouse's report of the occupations of members of the Association as learned by a questionnaire study conducted by the Committee on the Economic and Legal Status of Women, the latter contributing definite if not startling facts regarding the type of work done and pay received by university women with various degrees and years of experience.

Electric Range Cooking. An annotated bibliography of the literature on this subject has been prepared by Alice M. Child and Florence Connolly Kelley of the division of home economics, University of Minnesota. The work was made possible by funds from the Minnesota State Committee on the Relation of Electricity to Agriculture and by the cooperation of the division of agricultural engineering at the University. Mimeographed copies may be obtained on request to the National Electric Light Association, Engineering Building, 29 West Thirty-ninth Street, New York City.

National Health Council. The annual statement recently issued as a fifty-six page pamphlet from Council headquarters at 370 Seventh Avenue, New York City, includes brief statements of the organization and work of the Council and its fifteen member organizations. Those of the Council include a service department among whose noteworthy contributions are those made by the National Health Library and its bibliographical lists, and by a committee on health films.

Standardization in Sweden. A recent report from Sweden gives the following items as among those for which standards are adopted: kitchen stoves and hot-water tanks; kitchen furniture, such as cupboards, dressers, and work tables; details for plumbing installations, such as wash-basins, bathtubs, and sinks.

Holland Institute of Thermology. A. H. Landwehr, president of the Holland Furnace Company, has established an institute for research in problems of household heating and ventilation in connection with the company's plant at Holland, Michigan. It is described as a public service institution with the purpose "of making American homes healthier places to live in and of improving the relative humidity in them so that fabrics, furniture and other household goods do not disintegrate so rapidly as they do in excessively dry houses and apartments," and the scientific resources are to be fully used "to teach the American home owner in a practical way the science of healthful heating and ventilation."

Bottled Carbonated Beverages. A mimeographed list of references to books and articles on the manufacture, regulation, composition, and nutritive value of the products commonly known as "soft drinks" has been compiled by the department of home economics of the American Bottlers of Carbonated Beverages, Bond Building, Washington, D. C., and may be obtained from that office on request.

Study of Boys Clubs. New York University announces the appropriation of $36,000 to its department of educational sociology for a three-year study of boys clubs in New York City. Eight fellowships and eight tuition scholarships are provided. Director of the project is Dr. Frederick M. Thrasher, New York University, Washington Square, East, New York City and applications should be filed with him.